Conduction Cooled Capacitor Application Notes

Conduction cooled capacitors are designed for use in high power resonant (tank) circuits. Typically, these circuits consist of a capacitor and an inductor connected either in series or parallel.

The resonant frequency in these LC circuits is found when the reactance of the capacitor and the inductor are equal

\[ X_L = X_c \]

\[ \omega L = \frac{1}{\omega C} \]

\[ \omega = \frac{1}{\sqrt{LC}} \]

\[ f_0 = \frac{1}{2\pi\sqrt{LC}} \]

Active, apparent and reactive power

Active or real power is the actual power that can be delivered to the load.

\[ P = V^*I \text{ Watts} \]
Reactive or imaginary power is

Reactive power = \( V \times I \times \sin \Phi = V^2 \times 2 \times \pi \times f \times C \)

Reactive power is expressed in volt ampere reactive (var).

Apparent power is the power supplied to the circuit. Apparent power is measured in volt-amperes (VA). Apparent power is the voltage multiplied by the current in an AC system. Apparent power is the vector sum of the active and reactive power.

\[ S = \sqrt{Q^2 + P^2} \]

\( S \) = apparent power (Kilovolt amps, kva)

\( Q \) = reactive power (kilovolt amp reactive, kvar)

\( P \) = active power (kilowatts, kw)