

Power-Factor Correction

Electrical Engineering

Sizing capacitance to raise an inductive installation's power factor to a target.

Real power stays fixed throughout; only the reactive part is being changed.

1

Measure P and the present pf

Real power in kW and the existing power factor at normal duty.

2

Find the present reactive power

$Q_1 = P \tan \varphi_1$, where φ_1 is arccos of the present power factor.

3

Set the target

Pick a target power factor, then compute $Q_2 = P \tan \varphi_2$ at that angle.

4

Size the capacitor bank

$Q_C = Q_1 - Q_2$, then $C = Q_C / (2\pi f V^2)$ at the connected voltage.

5

Check for resonance

Bank plus supply inductance can resonate near a harmonic; detune if it does.

Educational reference. Capacitor banks hold dangerous stored charge and their installation is governed by local electrical regulations.