

Capacitor Bank Size Calculator

Estimate required power-factor correction kVAR and capacitance per phase from real power, current and target power factor, system voltage, frequency, and capacitor connection.

Generated October 10, 2026

<https://www.elecatrrix.com/power-quality-transformers/capacitor-bank-size-calculator/>

Inputs

Input	Value	Unit
Real power	120	kW
Current power factor	0.8	PF
Target power factor	0.95	PF
System voltage	480	V
Frequency	60	Hz
Capacitor connection	Three-phase delta	

Results

Result	Value	Unit
Current reactive power	90	kVAR
Target reactive power	39.4421	kVAR
Required correction	50.5579	kVAR
Capacitance per phase	194.0235	uF
Connection divisor	3	x
Frequency used	60	Hz

Calculation details

Detail	Value	Unit
Calculation basis	Correction kVAR uses the power triangle. Capacitance is estimated from kVAR, frequency, voltage, and the selected connection divisor.	

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Selection boundary

Capacitor bank estimate only; no step schedule, harmonic filter, resonance check, switching gear, utility approval, listing, equipment rating, or code-compliance result is made.

Formulas

P =real power,quad $PF_{current}$ =current power factor,quad PF_{target} =target power factor

f =frequency,quad V =system voltage,quad $k_{connection}=3$ for three-phase delta; otherwise 1

$$Q_{current} = P \times \tan(\cos^{-1}(PF_{current}))$$

$$Q_{target} = P \times \tan(\cos^{-1}(PF_{target}))$$

$$Q_C = Q_{current} - Q_{target}$$

$$C_{phase} = \frac{Q_C}{1000k_{connection} \times 2\pi f V^2}$$

Warnings and limitations

This capacitor bank size estimate is a screening calculation. It does not select capacitor equipment, harmonic filters, switching controls, fusing, utility approval, or code compliance.