# Capacitor kvar to Microfarad Calculator (Single and Three Phase)

Capacitance in microfarads for a capacitor of given kvar at a voltage and frequency, single phase or three phase in delta or star, with current and reactance.

**Method:** Q = ω C V² per element (AC circuit theory)

## Input parameters

Unit system: SI

| Parameter | Value | Unit |
|---|---|---|
| Reactive power of the bank | 25.000 | kvar |
| Voltage (line to line for three phase) | 415.00 | V |
| Frequency | 50.000 | Hz |
| Connection | Three phase, delta | |

## Calculated results

| Parameter | Value | Unit |
|---|---|---|
| Capacitance of each element (per phase) | 154.02 | µF |
| Line current | 34.780 | A |
| Reactance of each element | 20.667 | Ω |

## Formula and method

$$C_{\Delta} = \frac{Q}{3\omega V^2}, \quad C_{Y} = \frac{Q}{\omega V^2}, \quad C_{1\phi} = \frac{Q}{\omega V^2}, \quad \omega = 2\pi f$$

### Variables

| | | |
|---|---|---|
| $Q$ | Reactive power of the bank | var |
| $V$ | Voltage (line to line for three phase) | V |
| $f$ | Frequency | 1/s |
| $\mathrm{conn}$ | Connection | - |
| $C$ | Capacitance of each element (per phase) | F |
| $I$ | Line current | A |
| $X_C$ | Reactance of each element | Ω |

### Method and standards

Reactive power of a capacitor, Q = V²/X_C per element.

### Assumptions and limits

- Ideal capacitors; rated voltage and frequency.

### References

- Q = ω C V² per element (AC circuit theory)

## Report details

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|---|---|
| Report reference | FCC-GEBG-6NWN (the same inputs always give the same reference) |
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| Calculator | Capacitor kvar to Microfarad Calculator (Single and Three Phase) |
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| Release checks | 3 reference cases of this calculator, computed independently, are checked on every release |

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

### This calculator online

https://calc.firecad.com/electrical/power/capacitor-kvar-microfarad

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.