1 / 12 · Electrical Theory and Calculations

Three-phase current from VA?

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2 / 12 · Electrical Theory and Calculations

Handy products: 1.732 x 208, x 240 and x 480?

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3 / 12 · Electrical Theory and Calculations

kVA from kW and power factor?

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4 / 12 · Electrical Theory and Calculations

What does raising power factor do to line current for the same kW?

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5 / 12 · Electrical Theory and Calculations

Single-phase voltage drop formula (circular mil method)?

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6 / 12 · Electrical Theory and Calculations

Three-phase voltage drop formula?

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2 / 12 · Electrical Theory and Calculations

360.3, 415.7 and 831.4.

Electrical theory: three-phase power

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1 / 12 · Electrical Theory and Calculations

I = VA ÷ (1.732 x line-to-line volts).

Electrical theory: three-phase power

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4 / 12 · Electrical Theory and Calculations

Lowers it. New current = old current x old PF ÷ new PF.

Electrical theory: power factor correction

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3 / 12 · Electrical Theory and Calculations

kVA = kW ÷ PF. kVA is always the larger number.

Electrical theory: power factor

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6 / 12 · Electrical Theory and Calculations

VD = 1.732 x K x I x L ÷ CM.

Electrical theory: voltage drop

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5 / 12 · Electrical Theory and Calculations

VD = 2 x K x I x L ÷ CM, with L the one-way length.

Electrical theory: voltage drop

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7 / 12 · Electrical Theory and Calculations

K for copper and for aluminum?

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8 / 12 · Electrical Theory and Calculations

Sizing a conductor for drop: which formula?

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9 / 12 · Electrical Theory and Calculations

Where do conductor areas in circular mils come from?

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10 / 12 · Electrical Theory and Calculations

Are 3% and 5% voltage drop NEC requirements?

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11 / 12 · Electrical Theory and Calculations

Transformer full-load current, three-phase?

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12 / 12 · Electrical Theory and Calculations

Maximum fault current at a transformer secondary (infinite primary)?

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8 / 12 · Electrical Theory and Calculations

CM = 2 x K x I x L ÷ VD (single-phase) or 1.732 x K x I x L ÷ VD (three-phase), then pick the first size at or above it.

Electrical theory: voltage drop; NEC 2023 Chapter 9

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7 / 12 · Electrical Theory and Calculations

About 12.9 for copper and 21.2 for aluminum, trade approximations rather than NEC values.

Electrical theory: voltage drop

bondingjumper.com · free Master check

10 / 12 · Electrical Theory and Calculations

Not for general circuits. They are recommendations in informational notes in Articles 210 and 215.

NEC 2023 Articles 210 and 215 (informational notes)

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9 / 12 · Electrical Theory and Calculations

The conductor properties table in Chapter 9.

NEC 2023 Chapter 9

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12 / 12 · Electrical Theory and Calculations

Full-load current x 100 ÷ %Z, the same as dividing by %Z as a decimal.

Electrical theory: short-circuit current

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11 / 12 · Electrical Theory and Calculations

I = kVA x 1,000 ÷ (1.732 x V), at the voltage of the side you want.

Electrical theory: transformer current

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