calculatoratoz.com

unitsconverters.com

AC Power Formulas

Calculators! Examples! Conversions!

Bookmark **calculatoratoz.com**, **unitsconverters.com**

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**
Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**
Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

Please leave your feedback here...

List of 12 AC Power Formulas

AC Power

1) Complex Power

Open Calculator

fx $$S = \sqrt{P^2 + Q^2}$$

ex $$270.5199\text{VA} = \sqrt{(235\text{W})^2 + (134\text{VAR})^2}$$

2) Complex Power given Power Factor

Open Calculator

fx $$S = \frac{P}{\cos(\Phi)}$$

ex $$271.3546\text{VA} = \frac{235\text{W}}{\cos(30^\circ)}$$

3) Power in Single-Phase AC Circuits

Open Calculator

fx $$P = V \cdot I \cdot \cos(\Phi)$$

ex $$236.4249\text{W} = 130\text{V} \cdot 2.1\text{A} \cdot \cos(30^\circ)$$

4) Power in Single-Phase AC Circuits using Current

Open Calculator

fx $$P = I^2 \cdot R \cdot \cos(\Phi)$$

ex $$229.1503\text{W} = (2.1\text{A})^2 \cdot 60\Omega \cdot \cos(30^\circ)$$

5) Power in Single-Phase AC Circuits using Voltage

Open Calculator

fx $$P = \frac{V^2 \cdot \cos(\Phi)}{R}$$

ex $$243.9305\text{W} = \frac{(130\text{V})^2 \cdot \cos(30^\circ)}{60\Omega}$$

6) Power in Three-Phase AC Circuits using Phase Current

Open Calculator

fx $$P = 3 \cdot V_{ph} \cdot I_{ph} \cdot \cos(\Phi)$$

ex $$249.4153\text{W} = 3 \cdot 240\text{V} \cdot 0.4\text{A} \cdot \cos(30^\circ)$$

7) Reactive Power

Open Calculator

fx $$Q = I \cdot V \cdot \sin(\Phi)$$

ex $$136.5\text{VAR} = 2.1\text{A} \cdot 130\text{V} \cdot \sin(30^\circ)$$

8) Reactive Power using Line-to-Neutral Current

Open Calculator

fx $$Q = 3 \cdot I_{ln} \cdot V_{ln} \cdot \sin(\Phi)$$

ex $$134.355\text{VAR} = 3 \cdot 1.3\text{A} \cdot 68.9\text{V} \cdot \sin(30^\circ)$$

9) Reactive Power using RMS Voltage and Current

Open Calculator

fx $$Q = V_{rms} \cdot I_{rms} \cdot \sin(\Phi)$$

ex $$135.125\text{VAR} = 57.5\text{V} \cdot 4.7\text{A} \cdot \sin(30^\circ)$$

10) Real Power in AC Circuit

Open Calculator

$$P = V \cdot I \cdot \cos(\Phi)$$

$$236.4249\text{W} = 130\text{V} \cdot 2.1\text{A} \cdot \cos(30^\circ)$$

11) Real Power using Line-to-Neutral Voltage

Open Calculator

$$P = 3 \cdot I_{ln} \cdot V_{ln} \cdot \cos(\Phi)$$

$$232.7097\text{W} = 3 \cdot 1.3\text{A} \cdot 68.9\text{V} \cdot \cos(30^\circ)$$

12) Real Power using RMS Voltage and Current

Open Calculator

$$P = I_{rms} \cdot V_{rms} \cdot \cos(\Phi)$$

$$234.0434\text{W} = 4.7\text{A} \cdot 57.5\text{V} \cdot \cos(30^\circ)$$

Variables Used

- **I** Current *(Ampere)*
- I_{ln} Line to Neutral Current *(Ampere)*
- I_{ph} Phase Current *(Ampere)*
- I_{rms} Root Mean Square Current *(Ampere)*
- **P** Real Power *(Watt)*
- **Q** Reactive Power *(Volt Ampere Reactive)*
- **R** Resistance *(Ohm)*
- **S** Complex Power *(Volt Ampere)*
- **V** Voltage *(Volt)*
- V_{ln} Line to Neutral Voltage *(Volt)*
- V_{ph} Phase Voltage *(Volt)*
- V_{rms} Root Mean Square Voltage *(Volt)*
- **Φ** Phase Difference *(Degree)*

Constants, Functions, Measurements used

- Function: **cos**, cos(Angle)
  Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- Function: **sin**, sin(Angle)
  Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- Function: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: **Electric Current** in Ampere (A)
  Electric Current Unit Conversion
- Measurement: **Power** in Volt Ampere (VA), Watt (W), Volt Ampere Reactive (VAR)
  Power Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle Unit Conversion
- Measurement: **Electric Resistance** in Ohm (Ω)
  Electric Resistance Unit Conversion
- Measurement: **Electric Potential** in Volt (V)
  Electric Potential Unit Conversion

Check other formula lists

- AC Circuit Design Formulas
- RLC Circuit Formulas
- AC Power Formulas

Feel free to SHARE this document with your friends!

PDF Available in

English Spanish French German Russian Italian Portuguese Polish Dutch

5/6/2024 | 9:44:53 AM UTC

Please leave your feedback here...