

Electric Power Consumed on an AC Circuit

Enter the voltage effective value, frequency and resistance value to find the power value of the circuit with resistance R. Draw a graph of the changes in power over a period of time.

Calculation

P : power consumption I : effective value of current

V : effective value of voltage

$$I_0 = N \cdot \sin \omega \cdot t \quad V_0 = M \cdot \sin \omega \cdot t \quad P_0 = I_0 \cdot V_0$$

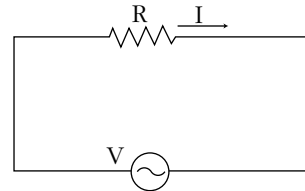
P₀ : change in amount of power with time

I₀ : change in amount of current with time

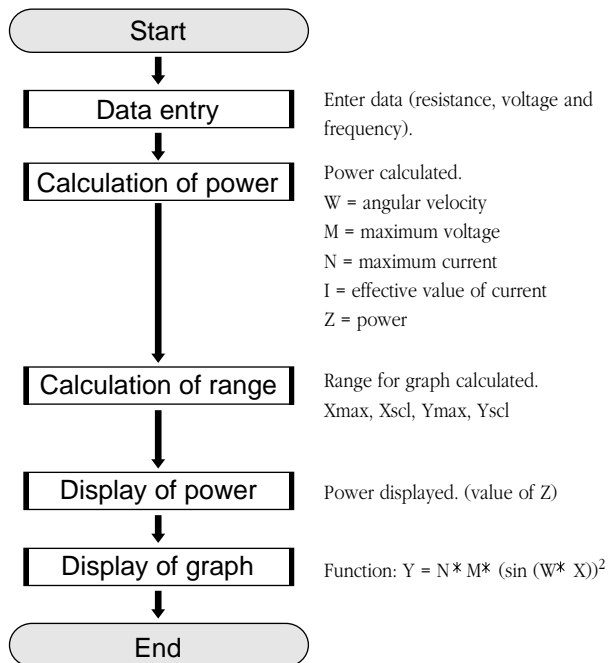
V₀ : change in amount of voltage with time

N : maximum value of current M : maximum value of voltage

ω : angular velocity ($2\pi S$) t : time S : frequency



FLOWCHART



PROGRAM LIST (REAL MODE)

Title : AC POWER

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Print "Input RESISTANCE
Input R
Print "Input VOLTAGE
Input V
Print "Input FREQUENCY
Input F
R  $\Rightarrow$  T
V  $\Rightarrow$  D
F  $\Rightarrow$  S
2 *  $\pi$  * S  $\Rightarrow$  W
D *  $\sqrt{2}$   $\Rightarrow$  M
M / T  $\Rightarrow$  N
N /  $\sqrt{2}$   $\Rightarrow$  I
D * I  $\Rightarrow$  Z
1 / S  $\Rightarrow$  Xmax
Xmax / 10  $\Rightarrow$  Xscl
N * M  $\Rightarrow$  Ymax
Ymax / 10  $\Rightarrow$  Yscl
Print "WATT=
Print Z
Wait
0  $\Rightarrow$  Xmin
0  $\Rightarrow$  Ymin
Draw N * M * (sin (W * X))2
End
  
```

PARAMETERS

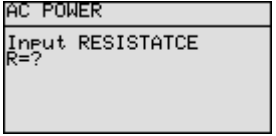
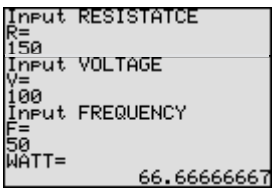
Name of parameter	Content	Name of parameter	Content
S	frequency	Xscl	scale of x-axis
I	effective value of current	Ymax	maximum value of y-axis
T	resistance value	Yscl	scale of y-axis
D	effective value of voltage	V	input of voltage
W	angular velocity	R	input of resistance value
N	maximum value of current	F	input of frequency
M	maximum value of voltage	Z	value of power
Xmax	maximum value of x-axis		

Exercise

Find the power value of an AC circuit with resistance value 150Ω , voltage effective value $100V$ and frequency $50Hz$ and display on a graph the changes in power over a period of time.

Set up condition: angle unit in Rad Mode and decimal point in Float Pt Mode.

2nd F **SET UP** **B*** **2*** **C*** **1*** **CL**

Step	Key Operation	Display
<p>1 Specify the program mode. Select the title AC POWER.</p>	<p>2nd F PRGM A*</p>	
<p>2 Enter the resistance value, voltage effective value, and frequency. (Display of value power)</p>	<p>1 5 0 ENTER 1 0 0 ENTER 5 0 ENTER</p>	
<p>3 (Display of graph)</p>	<p>ENTER</p>	