

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

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

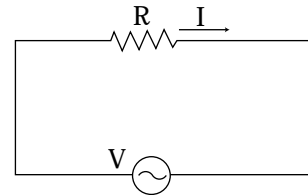
P_0 : change in amount of power with time

I_0 : change in amount of current with time

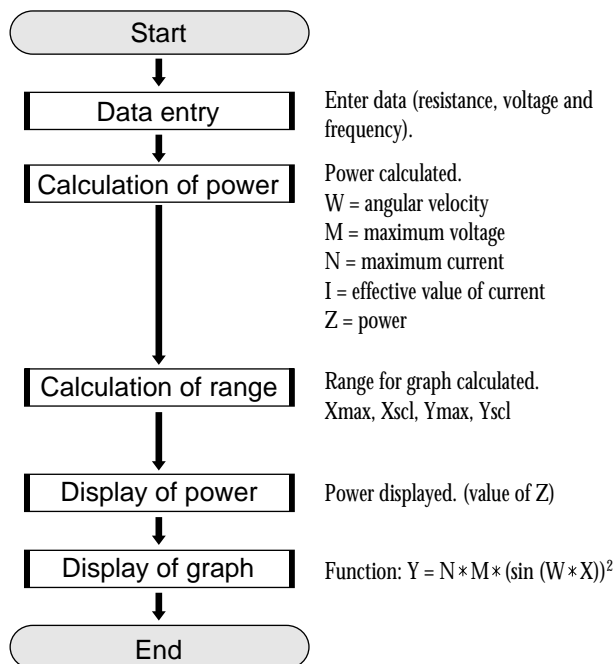
V_0 : change in amount of voltage with time

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

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



FLOWCHART



PROGRAMME LIST (REAL MODE)

Title : AC POWER

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Rad
Print "Input RESISTANCE
Input R
Print "Input VOLTAGE
Input V
Print "Input FREQUENCY
Input F
R ÷ T
V ÷ D
F ÷ S
2 * π * S ÷ W
D * √2 ÷ M
M / T ÷ N
N / √2 ÷ I
D * I ÷ Z
1 / S ÷ Xmax
Xmax / 10 ÷ Xscl
N * M ÷ Ymax
Ymax / 10 ÷ Yscl
Print "WATT=
Print Z
Wait
0 ÷ Xmin
0 ÷ Ymin
Draw N * M * (sin (W * X))^2
End
  
```

PARAMETERS

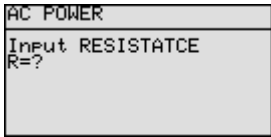
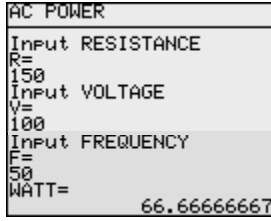
Name of parameter	Content	Name of parameter	Content
S	frequency	Xscl	scale of x-axis
I	effective value of current	Ymax	maximum value of y-axis
T	resistance value	Yscl	scale of y-axis
D	effective value of voltage	V	input of voltage
W	angular velocity	R	input of resistance value
N	maximum value of current	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: decimal point in Float Pt Mode.

2ndF **SETUP** **C** **1** **E** **1** **CL**

<u>Step</u>	<u>Key Operation</u>	<u>Display</u>
<p>1 Specify the programme mode. Select the title AC POWER.</p>	<p>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>	