

Power IN A.C CIRCUIT :-

In A.C circuit there are three types of power

1> Apparent Power (S)

2> Active Power (P)

3> Reactive Power (Q)

Let

V = R.M.S value of applied voltage

I = Current flowing in A.C circuit

ϕ = angle between voltage V and current I

1. Apparent Power (S) :-> It is the product of R.M.S value of the applied voltage and current. It is also known as wattless or ideal power.

$$S = V \cdot I$$

unit is volt amp.

July 11

Monday	4	11	18	25	
Tuesday	5	12	19	26	
Wednesday	6	13	20	27	
Thursday	7	14	21	28	
Friday	1	8	15	22	29
Saturday	2	9	16	23	30
Sunday	3	10	17	24	31

Notes

Appointment

11 July

Thursday

28

Day (209-156) • Week 31

②. Active Power \rightarrow It is the power which is developed in the circuit resistance.

$$P = VI \cos \phi$$

$\cos \phi \rightarrow$ Power factor.

$$P = VI \cdot \frac{R}{Z}$$

$$P = \frac{V}{Z} \cdot I \cdot R$$

$$P = I \cdot I \cdot R$$

$$P = I^2 R$$

Unit of active power is watt.

③. Reactive Power (ϕ) \rightarrow It is the power which is developed in the ckt reactance.

$$\phi = VI \sin \phi$$

$$= V \cdot I \cdot \frac{X}{Z}$$

Notes

Appointment

$$\phi = \frac{V}{Z} \cdot I \cdot X \rightarrow \text{reactance.}$$

August '11

Monday	1	8	15	22	29
Tuesday	2	9	16	23	30
Wednesday	3	10	17	24	31
Thursday	4	11	18	25	
Friday	5	12	19	26	
Saturday	6	13	20	27	
Sunday	7	14	21	28	

2011

29

Friday

July 29, 2011

July

20

$$V = I \cdot I \cdot X$$

$$V = I^2 X$$

Unit of reactive power is (VAR)

(Volt Amp Reactive)

Relation between three powers: →

$$S = VI ; \quad P = VI \cos \phi ; \quad Q = VI \sin \phi$$

$$P^2 + Q^2 = (VI \cos \phi)^2 + (VI \sin \phi)^2$$

$$P^2 + Q^2 = (VI)^2 (\cos^2 \phi + \sin^2 \phi)$$

$$P^2 + Q^2 = (S)^2 \cdot 1$$

$$P^2 + Q^2 = S^2$$

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

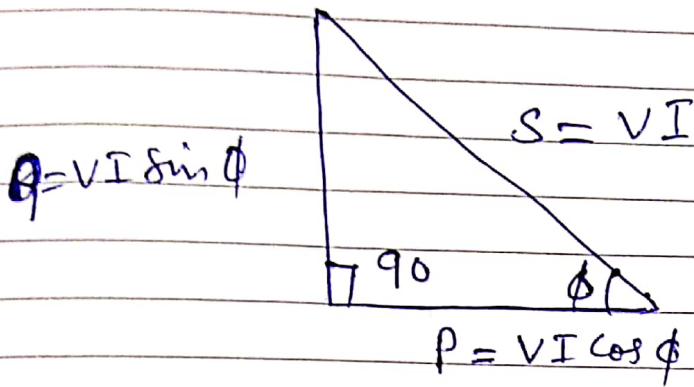
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Power Triangle.



$S^2 = P^2 + Q^2$

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

Notes

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