## Formulas

## Measurement unit abbreviations

E	voltage
hp	horsepower
I	current
Р	power
PF	power factor
R	resistance
RMS	root mean square
VA	apparent power
W	watts

## Constants

$\sqrt{2}$	1.41
$\sqrt{3}$	1.73
π	3.14

## Formulas

Descriptions	Full	Abbreviated
Area of circle	pi $ imes$ radius squared	πr²
Current	voltage resistance	E R
Current <sub>(average)</sub> (full wave)	Current <sub>(maximum)</sub> × 0.6365	$I_{(max)}  imes 0.6365$
Current <sub>(root meansquare)</sub>	Current <sub>(maximum)</sub> × 0.7071	$I_{(max)}  imes 0.7071$
Force	area $ imes$ pressure	

Frequency	poles × speed 120	
Line curren t (I <sub>line</sub> )	$\frac{\text{apparent power}}{(\text{line voltage } \times \sqrt{3})}$	$\frac{VA}{(E_{line} \times \sqrt{3})}$
Line current (I <sub>line</sub> ) (delta)	phase current $\times \sqrt{3}$	$l_{phase}  imes \sqrt{3}$
Line voltage (E <sub>line</sub> ) (wye)	phase voltage $\times \sqrt{3}$	$E_{phase}  imes \sqrt{3}$
Peak	root mean square $\times \sqrt{2}$	$RMS \times \sqrt{2}$
Power	current squared $ imes$ resistance	۴ × R
Power	horsepower $ imes$ 746 watts	hp $ imes$ 746 W
Power	voltage $ imes$ current $ imes$ power factor	E×I×PF
Power	voltage squared resistance	$\frac{E^2}{R}$
Power factor	cosine $ imes$ angle	$\cos  imes$ angle
Power factor	true power apparent power	P VA
Resistance	voltage squared power	E <sup>2</sup> P
Short circuit current (I <sub>short-circuit</sub> )	secondary current impedence	<u>secondary</u> %Z
Total power (P <sub>total</sub> )	line voltage $\times$ line current $\times$ power factor $\times \sqrt{3}$	$E_{line}  imes I_{line}  imes PF  imes \sqrt{3}$
Total power (P <sub>total</sub> )	phase voltage $\times$ phase current $\times$ power factor $\times$ 3	$E_{phase} \times I_{phase} \times PF \times 3$

Tum ratio	number of primary turns =   number of secondary turns =   primary voltage =   secondary voltage =   current in the secondary =   current in the primary =	$\frac{N_{p}}{N_{s}} = \frac{E_{p}}{E_{s}} = \frac{I_{s}}{I_{p}}$
Volt - amperes	line voltage × line current $\times \sqrt{3}$	$E_{line}  imes I_{line}  imes \sqrt{3}$
Volt - amperes	phase voltage $ imes$ phase current $ imes$ 3	$E_{phase}  imes L_{phase}  imes 3$