Formulas

Measurement unit abbreviations

E	voltage
hp	horsepower
I	current
P	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 × radius squared	πr^2
Current	$\frac{\text{voltage}}{\text{resistance}}$	$\frac{E}{R}$
$\text{Current}_{(\text{average})}$ (full wave)	$\text{current}_{(\text{maximum})} \times 0.6365$	$I_{(max)} \times 0.6365$
$\text{Current}_{(\text{root meansquare})}$	$\text{current}_{(\text{maximum})} \times 0.7071$	$I_{(max)} \times 0.7071$
Force	area × pressure	

Formulas (continued)

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

Formulas (continued)

Turn ratio	$\frac{\text{number of primary turns}}{\text{number of secondary turns}} = \frac{\text{primary voltage}}{\text{secondary voltage}} = \frac{\text{current in the secondary}}{\text{current in the primary}}$	$\frac{N_p}{N_s} = \frac{E_p}{E_s} = \frac{I_s}{I_p}$
Volt - amperes	line voltage × line current × $\sqrt{3}$	$E_{line} \times I_{line} \times \sqrt{3}$
Volt - amperes	phase voltage × phase current × 3	$E_{phase} \times I_{phase} \times 3$