kW to Amps Calculator (DC, Single Phase, Three Phase)

Current drawn by a load from its power in kW, the voltage, power factor and efficiency, for DC, single-phase and three-phase supplies, with kVA and kvar.

Method: AC power relations P = √3 V I cos φ (3φ); P = V I cos φ (1φ); ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Power (output, or input if efficiency is 100 %)	75.000	kW
Voltage (line to line for three phase)	415.00	V
Power factor (AC)	0.85000	
Efficiency	100.00	%
Supply	Three phase AC	

Calculated results

Parameter	Value	Unit
Current	122.75	A
Input power	75.000	kW
Apparent power	88.235	kVA
Reactive power	46.481	kvar

Formula and method

$$I = \frac{P}{\sqrt{3}\,V\cos\varphi\,\eta}\ (3\phi),\quad I = \frac{P}{V\cos\varphi\,\eta}\ (1\phi),\quad I = \frac{P}{V\eta}\ (\mathrm{DC})$$

Variables

P	Power (output, or input if efficiency is 100 %)	W
V	Voltage (line to line for three phase)	V
$\cos\varphi$	Power factor (AC)	-
η	Efficiency	-
supply	Supply	-
I	Current	A
P_{in}	Input power	W
S	Apparent power	VA
Q	Reactive power	var

Method and standards

Definition of active power.

Assumptions and limits

- Balanced load, sinusoidal supply.

References

- AC power relations P = √3 V I cos φ (3φ)
- P = V I cos φ (1φ)
- P = V I (DC)

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/electrical/power/kw-to-amps

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.