Electrical Units

Quantity	Symbol	Equation	SI unit	SI unit symbol	CGS unit	Ratio of Magnitude of SI to cgs unit
Current	*I, i*	*I=E/R; I = E/Z; I = Q/t*	Ampere	A	Abampere	10^{-1}
Quantity	*Q, q*	*Q = it; Q = CE*	Coulomb	C	Abcoulomb	10^{-1}
Electromotive force	*E, e*	*E = IR; E = W/Q*	Volt	V	Abvolt	10^{8}
Resistance	*R, r*	*R=E/I; R = ρl /A*	Ohm	Ω	Abohm	10^{9}
Resistivity	*ρ*	*ρ = RA / l*	Ohm-metre	Ω•m	Abohm-cm	10^{11}
Conductance	*G, g*	*G =γ A / l G = A/ρl*	Siemens	S	Abmho	10^{-9}
Conductivity	*γ*	*γ = 1/ρ; γ = l/ RA*	Siemens/meter	S/m	Abmho/cm	10^{-11}
Capacitance	*C*	*C = Q/E*	Farad	F	Abfarad*	10^{-9}
Permittivity	*ϵ*		Farads/meter	F/m	Stat farad*/cm	8.85 X 10^{-12}
Relative permittivity	ϵ_r	$\epsilon_r = \epsilon/\epsilon_o$	Numerical		Numerical	I
Self-inductance	*L*	*L = - N(dϕ/dt)*	Henry	H	Abhenry	10^{9}
Mutual inductance	*M*	$M = K(L_1L_2)^{1/2}$	Henry	H	Abhenry	10^{9}
Energy	*J*	*J = eit*	Joule	J	Erg	10^{7}
	kwh	*kwh = kw/3600; 3.6 MJ*	Kilowatthour	kWh		36 X 10^{12}
Active power	*W*	*W = J/t; W = EI cos Θ*	Watt	W	Abwatt	10^{7}
Reactive power	*jQ*	*Q = EI sin Θ*	Var	var	Abvar	10^{7}
Apparent power	*VA*	*VA = EI*	Volt-ampere	VA		
Power factor	*pf*	*pf = W/VA; pf = W/(W + jQ)*				1
Reactance, inductive	X_L	$X_L = 2\pi fL$	Ohm	Ω	Abohm	10^{9}
Reactance, capacitive	X_C	$X_C = 1/(2\pi fC)$	Ohm	Ω	Abohm	10^{9}
Impedance	*Z*	$Z = E/I\ Z = R + j(X_L - X_C)$	Ohm	Ω	Abohm	10^{9}
Conductance	*G*	$G = R/Z^2$	Siemens	S	Abmho	10^{-9}
Susceptance	*B*	$B = X/Z^2$	Siemens	S	Abmho	10^{-9}
Admittance	*Y*	*Y =I/E; Y = G + jB*	Siemens	S	Abmho	10^{-9}
Frequency	*f*	*f = 1/T*	Hertz	Hz	Cps Hz	1
Period	*T*	*T = 1/f*	Second	s	Second	1
Time constant	*T*	*L/R; RC*	Second	s	Second	1
Angular velocity	*ω*	*ω = 2πf*	Radians/second	rad/s	Radians/second	1

*1 Abfarad (EMU Units) = 9 X 10^{-20} stat farads (ESU units).