

APPENDIX A | UNITS

Quantity	Common Symbol	Unit	Unit in Terms of Base SI Units
Acceleration	$\vec{a}$	m/s ²	m/s ²
Amount of substance	n	mole	mol
Angle	θ, ϕ	radian (rad)	
Angular acceleration	$\vec{\alpha}$	rad/s ²	s ⁻²
Angular frequency	ω	rad/s	s ⁻¹
Angular momentum	$\vec{L}$	kg · m ² /s	kg · m ² /s
Angular velocity	$\vec{\omega}$	rad/s	s ⁻¹
Area	A	m ²	m ²
Atomic number	Z		
Capacitance	C	farad (F)	A ² · s ⁴ /kg · m ²
Charge	q, Q, e	coulomb (C)	A · s
Charge density:			
Line	λ	C/m	A · s/m
Surface	σ	C/m ²	A · s/m ²
Volume	ρ	C/m ³	A · s/m ³
Conductivity	σ	1/Ω · m	A ² · s ³ /kg · m ³
Current	I	ampere	A
Current density	$\vec{J}$	A/m ²	A/m ²
Density	ρ	kg/m ³	kg/m ³
Dielectric constant	κ		
Electric dipole moment	$\vec{p}$	C · m	A · s · m
Electric field	$\vec{E}$	N/C	kg · m/A · s ³
Electric flux	Φ	N · m ² /C	kg · m ³ /A · s ³
Electromotive force	$\mathcal{E}$	volt (V)	kg · m ² /A · s ³
Energy	E, U, K	joule (J)	kg · m ² /s ²
Entropy	S	J/K	kg · m ² /s ² · K

Table A1 Units Used in Physics (Fundamental units in bold)

Quantity	Common Symbol	Unit	Unit in Terms of Base SI Units
Force	$\vec{F}$	newton (N)	$\text{kg} \cdot \text{m}/\text{s}^2$
Frequency	f	hertz (Hz)	s^{-1}
Heat	Q	joule (J)	$\text{kg} \cdot \text{m}^2/\text{s}^2$
Inductance	L	henry (H)	$\text{kg} \cdot \text{m}^2/\text{A}^2 \cdot \text{s}^2$
Length:	ℓ, L	meter	m
Displacement	$\Delta x, \Delta \vec{r}$		
Distance	d, h		
Position	$x, y, z, \vec{r}$		
Magnetic dipole moment	$\vec{\mu}$	$\text{N} \cdot \text{J}/\text{T}$	$\text{A} \cdot \text{m}^2$
Magnetic field	$\vec{B}$	tesla(T) = (Wb/m^2)	$\text{kg}/\text{A} \cdot \text{s}^2$
Magnetic flux	Φ_m	weber (Wb)	$\text{kg} \cdot \text{m}^2/\text{A} \cdot \text{s}^2$
Mass	m, M	kilogram	kg
Molar specific heat	C	$\text{J}/\text{mol} \cdot \text{K}$	$\text{kg} \cdot \text{m}^2/\text{s}^2 \cdot \text{mol} \cdot \text{K}$
Moment of inertia	I	$\text{kg} \cdot \text{m}^2$	$\text{kg} \cdot \text{m}^2$
Momentum	$\vec{p}$	$\text{kg} \cdot \text{m}/\text{s}$	$\text{kg} \cdot \text{m}/\text{s}$
Period	T	s	s
Permeability of free space	μ_0	$\text{N}/\text{A}^2 = (\text{H}/\text{m})$	$\text{kg} \cdot \text{m}/\text{A}^2 \cdot \text{s}^2$
Permittivity of free space	ϵ_0	$\text{C}^2/\text{N} \cdot \text{m}^2 = (\text{F}/\text{m})$	$\text{A}^2 \cdot \text{s}^4/\text{kg} \cdot \text{m}^3$
Potential	V	volt(V) = (J/C)	$\text{kg} \cdot \text{m}^2/\text{A} \cdot \text{s}^3$
Power	P	watt(W) = (J/s)	$\text{kg} \cdot \text{m}^2/\text{s}^3$
Pressure	p	pascal(Pa) = (N/m^2)	$\text{kg}/\text{m} \cdot \text{s}^2$
Resistance	R	ohm(Ω) = (V/A)	$\text{kg} \cdot \text{m}^2/\text{A}^2 \cdot \text{s}^3$
Specific heat	c	$\text{J}/\text{kg} \cdot \text{K}$	$\text{m}^2/\text{s}^2 \cdot \text{K}$
Speed	v	m/s	m/s
Temperature	T	kelvin	K
Time	t	second	s
Torque	$\vec{\tau}$	$\text{N} \cdot \text{m}$	$\text{kg} \cdot \text{m}^2/\text{s}^2$

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Quantity	Common Symbol	Unit	Unit in Terms of Base SI Units
Velocity	$\vec{v}$	m/s	m/s
Volume	V	m ³	m ³
Wavelength	λ	m	m
Work	W	joule(J) = (N · m)	kg · m ² /s ²

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