

Appendix C

Units

The HP 49G contains a catalog of 127 units that you can use to create *unit objects*. A unit object is a real number linked to a unit expression by the underscore character. For example, **2_in** is a unit object representing 2 inches.

The calculator's units are based on the 7 base units of the International System of Units: *m* (meter), *kg* (kilogram), *s* (second), *A* (ampere), *K* (kelvin), *cd* (candela), and *mol* (mole). The HP 49G makes use of two additional base units: *r* (radian) and *sr* (steradian). The remaining 118 units are compound units, that is, units derived from the 9 base units.

You select a unit by pressing $\left[\text{UNIT} \right]$, choosing the appropriate category from the Units menu—length, area, volume, etc.—and finally selecting the unit from the category submenu. You do this when creating a unit object or when converting one unit to another. You can also perform calculations using unit objects. (See *Advanced User's Guide* at <http://www.hp.com/calculators/hp49> for more information.)

Unit (Full Name)	Value in SI Units
a (are)	100 m ²
A (ampere)	1 A
acre (acre)	4046.87260987 m ²
arcmin (minute of arc)	2.90888208666 × 10 ⁻⁴ r
arcs (second of arc)	4.8481368111 × 10 ⁻⁶ r
atm (atmosphere)	101325 kg/m·s ²
au (astronomical unit)	1.495979 × 10 ¹¹ m
Å (angstrom)	1 × 10 ⁻¹⁰ m
b (barn)	1 × 10 ⁻²⁸ m ²
bar (bar)	100000 kg/m·s ²

Unit (Full Name) (Continued)	Value in SI Units
bbl (barrel)	0.158987294928 m ³
Bq (becquerel)	1 s ⁻¹
Btu (British thermal unit)	1055.05585262 kg·m ² /s ²
bu (bushel)	0.03523907 m ³
°C (degree Celsius)	274.15 K [°C + 273.15]
c (speed of light)	299792458 m/s
C (coulomb)	1 A·s
cal (calorie)	4.1868 kg·m ² /s ²
cd (candela)	1 cd
chain (chain)	20.1168402337 m
Ci (curie)	3.7 × 10 ¹⁰ s ⁻¹
ct (carat)	0.0002 kg
cu (US cup)	2.365882365 × 10 ⁻⁴ m ³
° (degree)	1.74532925199 × 10 ⁻² r
d (day)	86400 s
dB (decibel)	1 dB
dyn (dyne)	0.00001 kg·m/s ²
erg (erg)	0.0000001 kg·m ² /s ²
eV (electron volt)	1.60217733 × 10 ⁻¹⁹ kg·m ² /s ²
F (farad)	1 A ² ·s ⁴ /kg·m ²
°F (degrees Fahrenheit)	255.927777778 K
fath (fathom)	1.82880365761 m
fbm (board foot)	0.002359737216 m ³
fc (foot-candle)	10.7639104167 cd·sr/m ²

Unit (Full Name) (Continued)	Value in SI Units
Fdy (faraday)	96487 A·s
fermi (fermi)	1×10^{-15} m
flam (foot-lambert)	3.42625909964 cd/m ²
ft (international foot)	0.3048 m
ftUS (survey foot)	0.304800609601 m
g (gram)	0.001 kg
ga (standard freefall)	9.80665 m/s ²
gal (US gallon)	0.003785411784 m ³
galC (Canadian gallon)	0.00454609 m ³
galUK (UK gallon)	0.004546092 m ³
gf (gram-force)	0.00980665 kg·m/s ²
gmol (gram-mole)	1 mol
grad (gradients)	$1.57079632679 \times 10^{-2}$ r
grain (grain)	0.00006479891 kg
Gy (gray)	1 m ² /s ²
H (henry)	1 kg·m ² /A ² ·s ²
ha (hectare)	10000 m ²
h (hour)	3600 s
hp (horsepower)	745.699871582 kg·m ² /s ³
Hz (hertz)	1 s ⁻¹
in (inch)	0.0254 m
inHg (inches of mercury, 0°C)	3386.38815789 kg/m·s ²
inH ₂ O (inches of water, 60°F)	248.84 kg/m·s ²
J (joule)	1 kg·m ² /s ²

Unit (Full Name) (Continued)	Value in SI Units
K (kelvin)	1 K
kg (kilogram)	1 kg
kip (kilopound-force)	4448.22161526 kg·m/s ²
knot (nautical miles per hour)	0.514444444444 m/s
kph (kilometers per hour)	0.27777777777778 m/s
l (liter)	0.001 m ³
lam (lambert)	3183.09886184 cd/m ²
lb (avoirdupois pound)	0.45359237 kg
lbf (pound-force)	4.44822161526 kg·m/s ²
lbmol (pound-mole)	453.59237 mol
lbt (troy pound)	0.3732417216 kg
lm (lumen)	1 cd·sr
lx (lux)	1 cd·sr/m ²
lyr (light year)	9.46052840488 × 10 ¹⁵ m
m (meter)	1 m
μ (micron)	1 × 10 ⁻⁶ m
mho (mho)	1 A ² ·s ³ /kg·m ²
mi (international mile)	1609.344 m
mil (mil)	0.0000254 m
min (minute)	60 s
miUS (US statute mile)	1609.34721869 m
mmHg (millimeter of mercury, or torr)	133.322368421 kg/m·s ²
mol (mole)	1 mol
mph (miles per hour)	0.44704 m/s

Unit (Full Name) (Continued)	Value in SI Units
N (newton)	1 kg·m/s ²
nmi (nautical mile)	1852 m
Ω (ohm)	1 kg·m ² /A ² ·s ³
oz (ounce)	0.028349523125 kg
ozfl (US fluid ounce)	2.95735295625 × 10 ⁻⁵ m ³
ozt (troy ounce)	0.03110341768 kg
ozUK (UK fluid ounce)	2.8413075 × 10 ⁻⁵ m ³
P (poise)	0.1 kg/m·s
Pa (pascal)	1 kg/m·s ²
pc (parsec)	3.08567818585 × 10 ¹⁶ m
pdl (poundal)	0.138254954376 kg·m/s ²
ph (phot)	10000 cd·sr/m ²
pk (peck)	0.0088097675 m ³
psi (pounds per square inch)	6894.75729317 kg/m·s ²
Pt (pint)	0.000473176473 m ³
qt (quart)	0.000946352946 m ³
r (radian)	1 r
R (röntgen)	0.000258 A·s/kg
°R (degrees Rankine)	0.555555555556 K
rad (rad)	0.01 m ² /s ²
rd (rod)	5.02921005842 m
rem (rem)	0.01 m ² /s ²
rpm (revolutions per minute)	0.0166666666667 s ⁻¹
s (second)	1 s

Unit (Full Name) (Continued)	Value in SI Units
S (siemens)	$1 \text{ A}^2 \cdot \text{s}^3 / \text{kg} \cdot \text{m}^2$
sb (stilb)	$10000 \text{ cd} / \text{m}^2$
slug (slug)	14.5939029372 kg
sr (steradian)	1 sr
st (stere)	1 m^3
St (stokes)	$0.0001 \text{ m}^2 / \text{s}$
Sv (sievert)	$1 \text{ m}^2 / \text{s}^2$
t (metric ton, or tonne)	1000 kg
T (tesla)	$1 \text{ kg} / \text{A} \cdot \text{s}^2$
tbsp (tablespoon)	$1.47867647813 \times 10^{-5} \text{ m}^3$
therm (EEC therm)	$105506000 \text{ kg} \cdot \text{m}^2 / \text{s}^2$
ton (short ton)	907.18474 kg
tonUK (long ton)	1016.0469088 kg
torr (torr)	$133.322368421 \text{ kg} / \text{ms}^2$
tsp (teaspoon)	$4.92892159375 \times 10^{-6} \text{ m}^3$
u (unified atomic mass)	$1.6605402 \times 10^{-27} \text{ kg}$
V (volt)	$1 \text{ kg} \cdot \text{m}^2 / \text{A} \cdot \text{s}^3$
W (watt)	$1 \text{ kg} \cdot \text{m}^2 / \text{s}^3$
Wb (weber)	$1 \text{ kg} \cdot \text{m}^2 / \text{A} \cdot \text{s}^2$
yd (international yard)	0.9144 m
yr (year)	31556925.9747 s