

## Tables

**Table 1 Units with special names and symbols<sup>1</sup>**

ALL VALUES DECIMAL

Unit Category		Dimension	The Universal Unit Systems			
			with the Rydberg constant(u)		Harmonic System (h)	
Coherent	base units that are not natural units	length	m <sub>u</sub>	272.102883 mm	m <sub>h</sub> or hm <sup>2</sup>	272.352206 mm
		time	s <sub>u</sub>	390.267520 ms	s <sub>h</sub> or nc	390.625115 ms
		energy	J <sub>u</sub>	64.143274 mJ	J <sub>h</sub>	64.084555 mJ
		temperature <sup>3</sup>	K <sub>u</sub>	58.441061 μK	K <sub>h</sub>	58.387561 μK
	base units that are natural units	plane angle	rad	(2/π) arc sin(1)		
		logarithm	neper	log(e)		
		amount of substance	mol <sub>n</sub> or N <sub>A</sub> <sup>-1</sup>	mol / 6.022140857 × 10. <sup>23</sup> .		
		impedance	Ω <sub>n</sub> , Z <sub>p</sub> or nh	29.9792458 Ω (=1sr/(ε <sub>0</sub> c <sub>0</sub> ) strict <sup>4</sup> , is called ‘nohm’)		
	derived units of electromagnetic quantities	charge	C <sub>u</sub>	28.896578 mC		
		electric current	A <sub>u</sub>	74.043000 mA	A <sub>h</sub>	73.975218 mA
		field strength	E <sub>u</sub> <sup>5</sup>	272.113986 mA/m	E <sub>h</sub>	271.616004 mA/m
		flux density	G <sub>u</sub> <sup>5</sup>	390.283444 mC/m <sup>2</sup>	G <sub>h</sub>	389.569207 mC/m <sup>2</sup>
	derived units of dynamical quantities	mass	g <sub>u</sub>	131.950080 g	g <sub>h</sub> or ℓℓ	131.829287 g
		power	W <sub>u</sub>	164.357194 mW	W <sub>h</sub>	164.056412 mW
		force	N <sub>u</sub>	235.731697 mN	N <sub>h</sub>	235.300297 mN

<sup>1</sup> Please see also <http://www.asahi-net.or.jp/~dd6t-sg/univunit-e/units.pdf> and <http://z13.invisionfree.com/DozensOnline/index.php?showtopic=371&st=6> for details. A web-based unit converter is available at <http://hosi.org:8080/cgi-bin/conv.cgi>.

<sup>2</sup> ‘harmon(hm)’, ‘nic(nc)’, ‘looloh(ℓℓ)’, and ‘nohm(nh)’ constitutes a quartet. These are the alias for common use.

<sup>3</sup> The unit of thermodynamic temperature has been changed. The new unit is one-1,0000;<sup>th</sup> of the old unit in the paper <http://dozenal.com> along with the introduction of the Earth local extension.

<sup>4</sup> If we adopt the elementary charge as one of the definition constants, Ω<sub>u</sub> is used in substitution for Ω<sub>n</sub>.

<sup>5</sup> The unit symbol E(Ørsted) and G(Gauß) are associated with the units of CGS unit system. In this paper, we adopt the metric unit names named after the scientists' name as it is. However, an alternative proposal to replace them with the names of the goddesses with the same initials have (i.e., Joule→Juno, Watt→Walküre, Newton→Nereide, Pascal→Polymnia, Coulomb→Clio, Ampere→Aoide, Ørsted→Erato, Gauß→Gaea, Kelvin→Korē) also been proposed.

		Pressure	$P_u$	3.183843 Pa	$P_h$	3.172201 Pa
Non-coherent	defining constants	wave number	$R_\infty$	10,973,731.568508/m ( is called ‘Rydberg’)		
		velocity	$c_0$	299,792,458 m/s (defined, and is called ‘light’)		
		action	$\hbar$	$1.054571800 \times 10^{-34} \text{ J s}$ ( is called ‘quantum’)		
		heat capacity	$k_B$	$1.38064852 \times 10^{-23} \text{ J/K}$ ( is called ‘Boltzmann’)		
Non-coherent	supplementary constants	the total solid angle of a hypersphere	$\Omega_k$	$\frac{2\pi^{\frac{k+1}{2}}}{\Gamma(\frac{k+1}{2})} \text{ rad}^k$ $k=0,1,2$ $\Omega_0=2$ $\Omega_1=2\pi \text{ rad}$ (circle, cycle) $\Omega_2=4\pi \text{ sr}$ (sphere, turn)		
		logarithm of an integer	$f_k$	$\log(2^k)$ $k=1(\text{bit}), d(\text{figure}), 4(\text{nibble}), 8(\text{byte}), \dots$ $d=\log_2(12.)$		
		amount of substance	$\text{mol}_u$	132.007618 mol $(=12^{.24}/N_A)$		
		elementary charge	$e$	$1.6021766208 \times 10^{-19} \text{ C}$ $(=\sqrt{\frac{\alpha \hbar}{\Omega_n}})$		

**Table 2 Physical, material and astronomical constants<sup>6</sup>**

ALL VALUES DOZENAL

Constant Symbols and Name (UNDERLINE INDICATES CONSTANT MAINTAINS SAME VALUE BETWEEN SYSTEMS u AND h)		Constant Value expressed by the Universal Unit Systems		Exponent $N$ of $\times 10^N$	Unit Symbol (u and h suffixes omitted)
		with the Rydberg constant (u)	Harmonic System (h)		
$R_\infty$	Rydberg constant	1	1;00170000	6;	$\Omega_1/\text{m}$
$c_0$	<u>the speed of light in vacuum</u>	1		8;	m/s
$\hbar$	<u>quantum of action</u>	1		-26;	J s
$k_B$	<u>Boltzmann constant</u>	1		-20;	J/K
$N_A$	<u>Avogadro constant</u>	1		20;	$\text{mol}^{-1}$
$R$	<u>gas constant</u>	1		0;	J/(mol K)
$u$	unified atomic mass unit	1;0009061	1;0024073	-20;	$\text{g}^{-7}$
$a_B$	Bohr Radius	1;005E85686	1;00447X740	-9;	m
$\alpha$	<u>fine structure constant</u>	1;07399405		-2;	-
$e$	<u>elementary charge</u>	1;0374439E		-14;	C
$m_e$	electron mass	0;E469222	0;E48324X	-23;	g

<sup>6</sup> If CODATA (2014) values are required, see <http://physics.nist.gov/cuu/Constants/index.html> .

<sup>7</sup> Because  $g_u$  is approximately  $100^{.10}$ ;  $u$ , I add alias name ‘looloh’ (lú:lou/əu) to  $g_h$ .

$\sigma$	<u>Stefan-Boltzmann constant</u>	1;E82E28		-1E;	W/(m <sup>2</sup> K <sup>4</sup> )
$m_G$	gravitic meter ( $\sqrt{2E}; l_P$ )	1;0018	1;0001	-27;	m
$l_P$	Planck length	2;0445	2;0413	-28;	m
$F_P$	Planck force ( $\hbar c_0 / l_P^2$ )	2;XE23	2;XEE5( $\div 2;E$ ) <sup>8</sup>	35;	N
$G$	Newtonian constant of gravitation ( $c_0^4 / F_P$ )	4;1574	4;1463	-X;	(m <sup>4</sup> /s <sup>4</sup> )/N
$\theta_W$	<u>weak mixing angle</u>	E;304		-2;	$\Omega_1$
$V_m$	molar volume of an ideal gas under standard conditions	1;02X468	1;025664	2;	m <sup>3</sup> /mol
	black-body radiation at the ice point	0;EX2462	0;EX8780	2;	W/m <sup>2</sup>
	maximum density of water	1;088184	1;092X47 ( $\div 15;14;$ )	2;	g/m <sup>3</sup>
	density of ice at the ice point	0;E7E9	0;E85E	2;	g/m <sup>3</sup>
	specific heat of water <sup>9</sup>	0;6052	0;6045 ( $\div 1/2$ )	0;	J/(g K)
	surface tension of water at 25°C	0;EE68	0;EEE4	-1;	N/m
atm	standard atmosphere	1;65008E	1;659967 ( $\div 1;66$ )	4;	P
$g_n$	standard gravitational acceleration	5;5X54XE9	5;5E21264 ( $\div E;2$ )	0;	m/s <sup>2</sup>
$r_E$	gravitational radius of Earth	2;41E8982X13	2;4180306534	-2;	m
au	astronomical unit	8;X67575537	8;X55509X33	X;	m
	<u>astronomical unit</u>	9;E91731X53		-3;	$c_0$ s <sub>E</sub> day

**Table 3 Power prefixes**

name	symbol	Plain text	value	name	symbol	Plain text	value
dirac <sup>10</sup>		D	10;				
<b>super</b>		<b>S</b>	<b>10;<sup>4</sup></b>	<b>sub</b>		<b>s</b>	<b>10;<sup>-4</sup></b>
<b>cosmic</b>	+	_+	10; <sup>8</sup> (=U)	<b>atomic</b>	-	_-	U <sup>-1</sup>
di-cosmic	2+	_2+	U <sup>2</sup>	di-atomic	2-	_2-	U <sup>-2</sup>
ter-cosmic	3+	_3+	U <sup>3</sup>	ter-atomic	3-	_3-	U <sup>-3</sup>
tetra-cosmic	4+	_4+	U <sup>4</sup>	tetra-atomic	4-	_4-	U <sup>-4</sup>
penta-cosmic	5+	_5+	U <sup>5</sup>	penta-atomic	5-	_5-	U <sup>-5</sup>
hexa-cosmic	6+	_6+	U <sup>6</sup>	hexa-atomic	6-	_6-	U <sup>-6</sup>
hepta-cosmic	7+	_7+	U <sup>7</sup>	hepta-atomic	7-	_7-	U <sup>-7</sup>

<sup>8</sup> If this is expressed as 2;E, the error from CODATA (2014) becomes -2;53(-2.44) times standard deviation.

<sup>9</sup> This corresponds to the definition of the thermodynamic calorie.

<sup>10</sup> ‘dirac’ is only used when expressing the unit of the Gravitic System with the Harmonic System. (i.e., gravitic meter = tetra-atomic dirac harmon, gravitic second = penta-atomic dirac nic, gravitic gram = atomic dirac looloh)

**Table 4 Examples of natural scale quantity representation <sup>11</sup>**

quantity	symbol	value	refer to
2E; penta-cosmic Newton	2E; <sub>5+</sub> N	2E;×U <sup>5</sup> [harmonic] Newton	the Planck force
6;di-cosmic nic	6; <sub>2+</sub> nic	6;×U <sup>2</sup> [harmoni]nic[second]	the age of the universe
cosmic super bit [Boltzmann]	<sub>+</sub> Sf <sub>1</sub> [k <sub>B</sub> ]	U <sup>1</sup> @4log2 <sup>1</sup> [Boltzmann]	1.01 Tera Byte(=2 <sup>43</sup> ·bit)
cosmic harmon	<sub>+</sub> hm	U <sup>1</sup> harmon[ic meter]	the speed of light in vacuum
unino atomic harmon	0;1.hm	U <sup>-1</sup> @ <sup>1</sup> harmon[ic meter]	the Bohr radius
di-atomic Coulomb	<sub>2</sub> .C	U <sup>-2</sup> [universal] Coulomb	the elementary charge
di-atomic effective Watt <sup>12</sup>	<sub>2</sub> .W <sub>e</sub>	U <sup>-2</sup> [harmonic]effective Watt	a photon power (540.THz)
ter-atomic looloh	<sub>3</sub> .ℓℓ	U <sup>-3</sup> looloh	the unified atomic mass unit
2; tetra-atomic harmon	2; <sub>4</sub> .hm	2;×U <sup>-4</sup> harmon[ic meter]	the Planck length

**Table 5 The Earth local extension for the Harmonic Universal Unit System**

category		name / description	symbol	plain text	value
Non-coherent calendar time	units	nic-angle (or octal second)	na		10; <sup>-3</sup> ×2 <sup>-7</sup> day
		day	day		1 Ω <sub>1</sub>
					‘day’ corresponds to 86,400. s at the beginning of year 1900.
		year	y or a		(365.+ 31./128. ) days
	span (or octal century)	span or “”		64. years	
Non-coherent unit and constants	difference between thermodynamic temperature and 118,2354; K <sub>h</sub> (≐ -74.36°C)	°S	deg S	1,0000; K <sub>h</sub> (≐1.210724 K ÷ 23./19. K)	
				100; 0000°S is 99.9839 °C	
				78;0000°S is 37.0262°C	
				61;0000°S is 14.0224°C	
				51;5026°S is 0.0000°C	
				99.9839 °C is the boiling point of water at the standard atmosphere.	
supple-mentary constants	the gravitational acceleration of the Earth (is called ‘gee [of Earth] ’)	g <sub>E</sub>	g_E or gee	5;611X615 harmon/nic <sup>2</sup> g <sub>E</sub> is defined as c <sub>0</sub> <sup>2</sup> r <sub>E</sub> (m <sub>E</sub> rad) <sup>-2</sup>	
	the rotation period of the Earth (is called ‘[Earth] solar’) at the beginning of year 1900.	s <sub>E</sub>	s_E or solar	0;EEEEEE153565 nic/nic-angle (This should be ‘coordinated’.)	
	the meridian length of the Earth (is called ‘[Earth] meridian’)	m <sub>E</sub>	m_E or meridian	4124,216E; harmon/Ω <sub>1</sub>	

<sup>11</sup> The part enclosed with '[']' can be omitted in Table 4 and Table 5.

<sup>12</sup> Units for quantity weighted by dimensionless human sensitivity are indicated by 'effective'.

W<sub>e</sub> corresponds to 1;di-cosmic photon energy(540.THz) / nic and 115.667210 lumen.