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CONTEXT MKIV

UNITS

Contents

1 Introduction

In ConTEXt MkII there is a module that implements consistent typesetting of units (quantities and dimensions). In MkIV this functionality is now part of the physics core modules. This is also one of the mechanisms that got a new user interface: instead of using commands we now parse text. Thanks to those users who provided input we're more complete now that in MkII. You can browse the mailing list archive to get some sense of history.

2 The main command

The core command is `\unit`. The argument to this command gets parsed and converted into a properly typeset dimension. Normally there will be a quantity in front.

```
10 meter                    10 m
10 meter per second         10 m/s
10 square meter per second  10 m²/s
```

The parser knows about special cases, like synonyms:

```
10 degree celsius   10 °C
10 degrees celsius  10 °C
10 celsius          10 °C
```

The units can be rather complex, for example:

```
\unit{30 kilo pascal square meter / second kelvin}
```

This comes out as: 30 kPa·m²/s·K. Depending on the unit at had, recognition is quite flexible. The following variants all work out ok.

```
10 kilogram   10 kg
10 kilo gram  10 kg
10 k gram     10 kg
10 kilo g     10 kg
10 k g        10 kg
10 kg         10 kg
10 kilog      10 kg
10 kgram      10 kg
```

Of course being consistent makes sense, so normally you will use a consistent mix of short or long keywords.

You can provide a qualifier that gets lowered and appended to the preceding unit.

```
\unit{112 decibel (A)}
```

This gives: 112 $\mathrm{dB_A}$. Combinations are also possible:

```
5 watt per meter celsius          5 W/m·°C
5 watt per meter degrees celsius  5 W/m·°C
5 watt per meter kelvin           5 W/m·K
5 watt per meter per kelvin       5 W/m/K
10 arcminute                      10′
10 arcminute 20 arcsecond         10′
```

3 Extra units

To some extent units can be tuned. You can for instance influence the spacing between a number and a unit:

```
                         \unit{35 kilogram per cubic meter}
\setupunit[space=normal] \unit{35 kilogram per cubic meter}
\setupunit[space=big]    \unit{35 kilogram per cubic meter}
\setupunit[space=medium] \unit{35 kilogram per cubic meter}
\setupunit[space=small]  \unit{35 kilogram per cubic meter}
\setupunit[space=none]   \unit{35 kilogram per cubic meter}
```

Of course no spacing looks rather bad:

35 $\mathrm{kg/m^3}$
35 $\mathrm{kg/m^3}$
35 $\mathrm{kg/m^3}$
35 $\mathrm{kg/m^3}$
35 $\mathrm{kg/m^3}$
35$\mathrm{kg/m^3}$

Another parameter is `separator`. In order to demonstrate this we define an extra unit command:

```
\defineunit[sunit][separator=small]
\defineunit[nunit][separator=none]
```

We now have two more commands:

```
\unit {35 kilogram cubic meter}
\sunit{35 kilogram cubic meter}
\nunit{35 kilogram cubic meter}
```

These three commands give different results:

35 $\mathrm{kg{\cdot}m^3}$
35 $\mathrm{kg\,m^3}$

35 kgm^3

Valid separators are `normal`, `big`, `medium`, `small`, `none`. You can let units stand out by applying color or a specific style.

```
\setupunit[style=\bi,color=maincolor]
\unit{10 square meter per second}
```

Keep in mind that all defined units inherit from their parent definition unless they are set up themselves.

10 m^2/s

To some extent you can control rendering in text and math mode. As an example we define an extra instance.

```
\defineunit[textunit][alternative=text]

test  \unit    {10 cubic meter per second}  test
test  \textunit{10 cubic meter per second}  test
test $\unit    {10 cubic meter per second}$ test
test $\textunit{10 cubic meter per second}$ test
test  10 \unit    {cubic meter per second}  test
test  10 \textunit{cubic meter per second}  test
test $10 \unit    {cubic meter per second}$ test
test $10 \textunit{cubic meter per second}$ test
```

test 10 m^3/s test
test 10 m^3/s test
test 10 m^3/s test
test 10 m^3/s test
test 10 m^3/s test
test 10 m^3/s test
test 10m^3/s test
test 10m^3/s test

4 Labels

The units, prefixes and operators are typeset using the label mechanism which means that they can be made to adapt to a language and/or adapted. Instead of language specific labels you can also introduce mappings that don't relate to a language at all. As an example we define some bogus mapping.

```
\setupunittext
  [whatever]
  [meter=retem,
   second=dnoces]

\setupprefixtext
  [whatever]
  [kilo=olik]

\setupoperatortext
```

```
  [whatever]
  [solidus={ rep }]
```

Such a mapping can be partial and the current language will be the default fallback and itselfs falls back on the English language mapping.

```
\unit{10 km/s}
\unit{10 Kilo Meter/s}
\unit{10 kilo Meter/s}
\unit{10 Kilo m/s}
\unit{10 k Meter/s}
```

When we typeset this we get the normal rendering:

10 km/s
10 km/s
10 km/s
10 km/s
10 km/s

However, when we change the language parameter, we get a different result:

10 olikretem rep dnoces
10 olikretem rep dnoces
10 olikretem rep dnoces
10 olikretem rep dnoces
10 olikretem rep dnoces

The alternative rendering is set up as follows:

```
\setupunit[language=whatever]
```

You can also decide to use a special instance of units:

```
\defineunit[wunit][language=whatever]
```

This will define the `\wunit` command and leave the original `\unit` command untouched.

5 Digits

In addition to units we have digits. These can be used independently but the same functionality is also integrated in the unit commands. The main purpose of this command is formatting in tables, of which we give an example below.

```
12,345.67 kilogram  12,345.67 kg
__,__1.23 kilogram       1.23 kg
__,___.12 kilogram        .12 kg
__,__1.== kilogram       1    kg
__,___:23 kilogram         23 kg
```

The _ character serves as placeholders. There are some assumptions to how numbers are constructed. In principe the input assumes a comma to separate thousands and a period to separate the fraction.

10 km/s 10 km/s 10 km/s 10 km/s 10 km/s

You can swap periods and commas in the output. In fact there are a few methods available. For instance we can separate the thousands with a small space instead of a symbol.

```
\starttabulate[|c|r|r|]
\HL
\NC 0 \NC \setupunit[method=0]\unit{00,000.10 kilogram}
      \NC \setupunit[method=0]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 1 \NC \setupunit[method=1]\unit{00,000.10 kilogram}
      \NC \setupunit[method=1]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 2 \NC \setupunit[method=2]\unit{00,000.10 kilogram}
      \NC \setupunit[method=2]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 3 \NC \setupunit[method=3]\unit{00,000.10 kilogram}
      \NC \setupunit[method=3]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 4 \NC \setupunit[method=4]\unit{00,000.10 kilogram}
      \NC \setupunit[method=4]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 5 \NC \setupunit[method=5]\unit{00,000.10 kilogram}
      \NC \setupunit[method=5]\unit{@@,@@0.10 kilogram} \NC \NR
\NC 6 \NC \setupunit[method=6]\unit{00,000.10 kilogram}
      \NC \setupunit[method=6]\unit{@@,@@0.10 kilogram} \NC \NR
\HL
\stoptabulate
```

0	00,000.10 kg	0.10 kg
1	00.000,10 kg	0,10 kg
2	00,000.10 kg	0.10 kg
3	00 000,10 kg	0,10 kg
4	00 000.10 kg	0.10 kg
5	00 000,10 kg	0,10 kg
6	00 000.10 kg	0.10 kg

The digit modes can be summarized as::

1. periods/comma
2. commas/period
3. thinmuskips/comma
4. thinmuskips/period
5. thickmuskips/comma
6. thickmuskips/period

You can reverse the order of commas and period in the input by setting the parameter `order` to `reverse`.

The digit parser handles a bunch of special characters as well as different formats. We strongly suggest you to use the grouped call.

`.` , . comma or period
`,` , . comma or period
`:` invisible period
`;` invisible comma

`_`		invisible space
`/`		invisible sign
`-`	−	minus sign
`+`	+	plus sign
`//`		invisible high sign
`--`	-	high minus sign
`++`	+	high plus sign
`=`	-	zero padding

Let's give some examples:

`1`	1
`12`	12
`12.34`	12.34
`123,456`	123,456
`123,456.78`	123,456.78
`12,34`	12,34
`.1234`	.1234
`1234`	1234
`123,456.78^9`	$123{,}456.78 \times 10^{9}$
`123,456.78e9`	$123{,}456.78 \times 10^{9}$
`/123,456.78e-9`	$123{,}456.78 \times 10^{-9}$
`-123,456.78e-9`	$-123{,}456.78 \times 10^{-9}$
`+123,456.78e-9`	$+123{,}456.78 \times 10^{-9}$
`//123,456.78e-9`	$123{,}456.78 \times 10^{-9}$
`--123,456.78e-9`	$-123{,}456.78 \times 10^{-9}$
`++123,456.78e-9`	$+123{,}456.78 \times 10^{-9}$
`___,___,123,456,789.00`	123,456,789.00
`___,___,_12,345,678.==`	12,345,678

6 Adding units

It is possible to add extra snippets. This is a two step process: first some snippet is defined, next a proper label is set up. In the next example we define a couple of TEX dimensions:

```
\registerunit
  [unit]
  [point=point,
   basepoint=basepoint,
   scaledpoint=scaledpoint,
   didot=didot,
   cicero=cicero]
```

Possible categories are: `prefix`, `unit`, `operator`, `suffix`, `symbol`,`packaged`. Next we define labels:

```
\setupunittext
  [point=pt,
   basepoint=bp,
   scaledpoint=sp,
   didot=dd,
```

```
   cicero=cc]
```

Now we can use use these:

```
\unit{10 point / second}
```

Of course you can wonder what this means.

10 pt/s

When no label is defined the long name is used:

```
\registerunit
  [unit]
  [page=page]
```

This is used as:

```
\unit{10 point / page}
```

Which gives:

10 pt/page

7 Goodies

Here are some goodies:

Instead of ± one can use `pm` and `to` can be used instead of –.

```
\type{1 } : \unit  {30^2            meter per second}
\type{2a} : \unit  {30    ± 10      meter per second}
\type{2b} : \unit  {30    – 10      meter per second}
\type{3a} : \unit  {30^2  ± 10^2    meter per second}
\type{3b} : \unit  {30^2  – 10^2    meter per second}
\type{4 } : \unit  {30   (10)       meter per second}
\type{5a} : \unit  {30   (± 10)     meter per second}
\type{5b} : \unit  {30^2 (± 10^2)   meter per second}
\type{6a} : \unit {(30    ± 10)     meter per second}
\type{6b} : \unit {(30^2  ± 10^2)   meter per second}
\type{6c} : \unit {(30^2  – 10^2)   meter per second}
\type{7a} : \unit {(30    ± 10)^2   meter per second}
\type{7b} : \unit {(30    – 10)^2   meter per second}
\type{7c} : \unit {(30^2  – 10^3)^5 meter per second}
```

Their rendering explains their intention:

1 : 30×10^2 m/s
2a : 30 ± 10 m/s
2b : $30 - 10$ m/s
3a : $30 \times 10^2 \pm 10 \times 10^2$ m/s
3b : $30 \times 10^2 - 10 \times 10^2$ m/s
4 : $30\ (10)$ m/s

5a : 30 (± 10) m/s
5b : 30×10^2 ($\pm 10 \times 10^2$) m/s
6a : (30 ± 10) m/s
6b : ($30 \times 10^2 \pm 10 \times 10^2$) m/s
6c : ($30 \times 10^2 - 10 \times 10^2$) m/s
7a : $(30 \pm 10) \times 10^2$ m/s
7b : $(30 - 10) \times 10^2$ m/s
7c : $(30 \times 10^2 - 10 \times 10^3) \times 10^5$ m/s

8 Built in keywords

A given sequence of keywords is translated in an list of internal keywords. For instance `m`, `Meter` and `meter` all become `meter` and that one is used when resolving a label. In the next tables the right column mentions the internal keyword. The right column shows the Cased variant, but a lowercase one is built-in as well.

The following prefixes are built-in:

units:operators		
OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P

Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi
Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3
ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2
Inverse	inverse	−1
Linear	linear	1
Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
Ampere	ampere	A
Angstrom	angstrom	Å
Astronomical Unit	astronomicalunit	au
AstronomicalUnit	astronomicalunit	au
Atm	atmosphere	atm
Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B

Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal
Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da
Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F
Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C
DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn
Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m

Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol
Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N
Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P
Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev
Second	second	s
Siemens	siemens	S
Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	·
.	times	·
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y

Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da
f	femto	f
h	hecto	h
k	kilo	k
m	milli	m
n	nano	n
p	pico	p
u	micro	µ
y	yocto	y
z	zetto	zetto

shortcuts:suffixes		
+1	linear	1
+2	square	2
+3	cubic	3
+4	quadratic	4
-1	ilinear	−1
-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
1	linear	1
2	square	2
3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4

shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h

hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min
n	newton	N
s	second	s
t	tonne	t
v	volt	V
	celsius	°C
	fahrenheit	°F

The following units are supported, including some combinations:

units:operators		
OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P
Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi

Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3
ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2
Inverse	inverse	−1
Linear	linear	1
Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
Ampere	ampere	A
Angstrom	angstrom	Å
Astronomical Unit	astronomicalunit	au
AstronomicalUnit	astronomicalunit	au
Atm	atmosphere	atm
Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B
Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal

Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da
Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F
Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C
DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn
Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m
Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol

Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N
Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P
Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev
Second	second	s
Siemens	siemens	S
Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	·
.	times	·
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y
Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da

f	femto	f
h	hecto	h
k	kilo	k
m	milli	m
n	nano	n
p	pico	p
u	micro	µ
y	yocto	y
z	zetto	zetto

shortcuts:suffixes		
+1	linear	1
+2	square	2
+3	cubic	3
+4	quadratic	4
-1	ilinear	−1
-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
1	linear	1
2	square	2
3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4

shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h
hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min

n	newton	N
s	second	s
t	tonne	t
v	volt	V
	celsius	°C
	fahrenheit	°F

The amount of operators is small:

units:operators		
OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P
Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi
Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3
ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2
Inverse	inverse	−1
Linear	linear	1
Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
Ampere	ampere	A
Angstrom	angstrom	Å
Astronomical Unit	astronomicalunit	au
AstronomicalUnit	astronomicalunit	au
Atm	atmosphere	atm
Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B
Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal
Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da

Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F
Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C
DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn
Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m
Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol
Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N

Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P
Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev
Second	second	s
Siemens	siemens	S
Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	·
.	times	·
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y
Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da
f	femto	f
h	hecto	h
k	kilo	k
m	milli	m

n	nano	n
p	pico	p
u	micro	µ
y	yocto	y
z	zetto	zetto

shortcuts:suffixes		
+1	linear	1
+2	square	2
+3	cubic	3
+4	quadratic	4
-1	ilinear	−1
-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
1	linear	1
2	square	2
3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4

shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h
hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min
n	newton	N
s	second	s
t	tonne	t
v	volt	V

	celsius	°C
	fahrenheit	°F

There is also a small set of (names) suffixes:

units:operators		
OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P
Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi
Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3

ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2
Inverse	inverse	−1
Linear	linear	1
Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
Ampere	ampere	A
Angstrom	angstrom	Å
Astronomical Unit	astronomicalunit	au
AstronomicalUnit	astronomicalunit	au
Atm	atmosphere	atm
Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B
Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal
Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da
Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F

Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C
DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn
Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m
Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol
Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N
Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P

Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev
Second	second	s
Siemens	siemens	S
Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	.
.	times	.
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y
Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da
f	femto	f
h	hecto	h
k	kilo	k
m	milli	m
n	nano	n
p	pico	p
u	micro	µ
y	yocto	y

z	zetto	zetto
shortcuts:suffixes		
+1	linear	1
+2	square	2
+3	cubic	3
+4	quadratic	4
-1	ilinear	−1
-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
1	linear	1
2	square	2
3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4
shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h
hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min
n	newton	N
s	second	s
t	tonne	t
v	volt	V
	celsius	°C
	fahrenheit	°F

Some symbols get a special treatment:

units:operators		
OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P
Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi
Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3
ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2

Inverse	inverse	−1
Linear	linear	1
Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
Ampere	ampere	A
Angstrom	angstrom	Å
Astronomical Unit	astronomicalunit	au
AstronomicalUnit	astronomicalunit	au
Atm	atmosphere	atm
Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B
Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal
Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da
Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F
Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C

DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn
Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m
Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol
Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N
Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P
Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev

Second	second	s
Siemens	siemens	S
Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	·
.	times	·
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y
Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da
f	femto	f
h	hecto	h
k	kilo	k
m	milli	m
n	nano	n
p	pico	p
u	micro	µ
y	yocto	y
z	zetto	zetto

shortcuts:suffixes

+1	linear	1
+2	square	2
+3	cubic	3
+4	quadratic	4
-1	ilinear	−1
-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
1	linear	1
2	square	2
3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4

shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h
hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min
n	newton	N
s	second	s
t	tonne	t
v	volt	V
	celsius	°C
	fahrenheit	°F

These are also special:

units:operators

OutOf	outof	:
Per	per	/
Solidus	solidus	/
Times	times	·

units:packaged		
Micron	micron	µm
mmHg	millimetermercury	mmHg

units:prefixes		
Atto	atto	a
Centi	centi	c
Deca	deca	da
Deci	deci	d
Exa	exa	E
Exbi	exbi	Ei
Femto	femto	f
Gibi	gibi	Gi
Giga	giga	G
Hecto	hecto	h
Kibi	kibi	Ki
Kilo	kilo	k
Mebi	mebi	Mi
Mega	mega	M
Micro	micro	µ
Milli	milli	m
Nano	nano	n
Pebi	pebi	Pi
Peta	peta	P
Pico	pico	p
Root	root	√
Tebi	tebi	Ti
Tera	tera	T
Yobi	yobi	Yi
Yocto	yocto	y
Yotta	yotta	Y
Zebi	zebi	Zi
Zepto	zepto	z
Zetta	zetta	Z

units:suffixes		
Cubic	cubic	3
ICubic	icubic	−3
ILinear	ilinear	−1
IQuadratic	iquadratic	−4
ISquare	isquare	−2
Inverse	inverse	−1
Linear	linear	1

Quadratic	quadratic	4
Square	square	2

units:symbols		
	percent	%
ArcMinute	arcminute	′
ArcSecond	arcsecond	″
Degree	degree	°
Degrees	degree	°
Percent	percent	%
Permille	permille	‰
Promille	permille	‰
°	degree	°
′	arcminute	′
″	arcsecond	″

units:units		
AMU	atomicmassunit	u
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Atmosphere	atmosphere	atm
Atomic Mass Unit	atomicmassunit	u
AtomicMassUnit	atomicmassunit	u
Bar	bar	bar
Barn	barn	b
Baud	baud	Bd
Bel	bel	B
Bequerel	bequerel	Bq
Bit	bit	bit
Byte	byte	B
Cal	calorie	cal
Calorie	calorie	cal
Candela	candela	cd
Celsius	celsius	°C
Coulomb	coulomb	C
Dalton	dalton	Da
Day	day	d
Degree Celsius	celsius	°C
Degree Fahrenheit	fahrenheit	°F
DegreeCelsius	celsius	°C
DegreeFahrenheit	fahrenheit	°F
Degrees Celsius	celsius	°C
Degrees Fahrenheit	fahrenheit	°F
DegreesCelsius	celsius	°C
DegreesFahrenheit	fahrenheit	°F
Dyne	dyne	dyn

Electron Volt	electronvolt	eV
ElectronVolt	electronvolt	eV
Erg	erg	erg
Erlang	erlang	E
Fahrenheit	fahrenheit	°F
Farad	farad	F
Foot	foot	ft
Gal	gal	gal
Gauss	gauss	G
Gon	gon	gon
Grad	grad	grad
Gram	gram	g
Gray	gray	Gy
Hectare	hectare	ha
Henry	henry	H
Hertz	hertz	Hz
Hg	mercury	Hg
Hour	hour	h
Inch	inch	inch
Joule	joule	J
Katal	katal	kat
Kelvin	kelvin	K
Knot	knot	kn
Liter	liter	l
Litre	liter	l
Lumen	lumen	lm
Lux	lux	lx
Maxwell	maxwell	Mx
Meter	meter	m
Metre	meter	m
Metric Ton	tonne	t
MetricTon	tonne	t
Minute	minute	min
Mol	mole	mol
Mole	mole	mol
Nautical Mile	nauticalmile	M
NauticalMile	nauticalmile	M
Neper	neper	Np
Newton	newton	N
Oersted	oersted	Oe
Ohm	ohm	Ω
Pascal	pascal	Pa
Phot	phot	phot
Poise	poise	P
Radian	radian	rad
Rev	revolution	rev
Revolution	revolution	rev
Second	second	s
Siemens	siemens	S

Sievert	sievert	Sv
Steradian	steradian	sr
Stilb	stilb	sb
Stokes	stokes	St
Tesla	tesla	T
Tonne	tonne	t
Volt	volt	V
Watt	watt	W
Weber	weber	Wb
basepoint	basepoint	bp
cicero	cicero	cc
didot	didot	dd
eV	electronvolt	eV
page	page	page
point	point	pt
scaledpoint	scaledpoint	sp

shortcuts:operators		
*	times	·
.	times	·
/	solidus	/
:	outof	:

shortcuts:prefixes		
E	exa	E
G	giga	G
M	mega	M
P	peta	P
T	tera	T
Y	yotta	Y
Z	zetta	Z
a	atto	a
c	centi	c
d	deci	d
da	deca	da
f	femto	f
h	hecto	h
k	kilo	k
m	milli	m
n	nano	n
p	pico	p
u	micro	µ
y	yocto	y
z	zetto	zetto

shortcuts:suffixes		
+1	linear	1
+2	square	2
+3	cubic	3

+4	quadratic	4
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-2	isquare	−2
-3	icubic	−3
-4	iquadratic	−4
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3	cubic	3
4	quadratic	4
^+1	linear	1
^+2	square	2
^+3	cubic	3
^+4	quadratic	4
^-1	ilinear	−1
^-2	isquare	−2
^-3	icubic	−3
^-4	iquadratic	−4
^1	linear	1
^2	square	2
^3	cubic	3
^4	quadratic	4

shortcuts:units		
A	ampere	A
B	bel	B
Hz	hertz	Hz
W	watt	W
b	bel	B
g	gram	g
h	hour	h
hz	hertz	Hz
l	liter	l
lx	lux	lx
m	meter	m
min	minute	min
n	newton	N
s	second	s
t	tonne	t
v	volt	V
	celsius	°C
	fahrenheit	°F

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version May 10, 2020
website www.pragma-ade.nl – www.contextgarden.net
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