

# Unit Pro

*Plus*

[Click to Enter](#)

**Southwest Technical Services**

► Unitpro help file

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## Unit-Pro Help Contents

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To learn how to use system Help, press Help and select "Contents".

**The Contents listed below in green are for Help topics available for Unit - Pro. Click on one of the following Help areas below to learn about Unit - Pro.**

Quick look at [Measurement systems](#) , [Basic Units](#)

## **Operations**

To review [Commands and Tools](#) procedures click here.

To review [Shortcut Keys](#) procedures click here.

To review [File menu Items](#) procedures click here.

To review [Edit menu Items](#) procedures click here.

## **Conversions**

To review [Procedures](#) click here.



To review KISS [METHOD](#) procedures click here.

## **Operation: Commands and Tools**

### **UNIT - PRO WINDOW**

Click the part of the Unit - Pro window you want to know more about.

## **Operation: Shortcut Keys**

Click a menu name to list the shortcut keys for conversion in Unit - Pro:

[Menu Area](#)

[Toolbar Pushbuttons](#)

[Conversion Status Field](#)

### **Menu Area Shortcut Keys**

<b>To choose</b>	<b>Press</b>
------------------	--------------

Any Title with an  
underlined letter

Area

ALT+ Letter A

## Toolbar Pushbuttons

To choose	Press
Exit	Click on Ex
Print	Click Printer symbol
Clear edit field	Click Clean page symbol
Next Menu	Click on Nm
Cut items from edit field	Click on Scissors
Copy items to clipboard	Click on Double Pages
Paste items from clipboard	Click on Clipboard
Unformatted output	Click on U (Default)
Standard notation	Click on S
3 digits format.	Click on 3
4 digits format	Click on 4
Scientific notation	Click on 10 <sup>x</sup>
Display normal text	Click on B (Default is <b>Bold</b> )

## Viewing Area Shortcut Keys

To choose	Press
Place conversion in edit field	Click cursor on that conversion
Edit field text	Add or cut text in edit field
Number for conversion	Enter value in input data box & enter
Change output format	Click on U S 3 4 10 <sup>x</sup> buttons
Same number for conversion	Click on recall button (after initial selection) & enter
Switch To .another application	Click on window upper left button
Read what the pushbuttons do	Place mouse on button(s) and look at status bar

## Help Menu to see the Help.pdf file

To choose	Press
Help Contents	Help Select "Contents"

## OPERATION: File Menu

There are two menu title items that are command functions, the **FILE** and EDIT menu title.

### Print

This command sends all of the conversions to the printer.

If there are no conversions displayed in the conversion status field a print command will cause a page to print with a **blank** printed on it.

### Bold

This command causes the text contents of the status area to be displayed in normal or in **BOLD** text. The default is bold and the B button on the toolbar looks as if depressed. To change the text to normal (not bold) just select from the file menu item or press the toolbar "B" pushbutton with the mouse.

### Exit

This command closes all Unit - Pro operations and exits the program. Exit may be selected from the File menu item or by pressing the Ex pushbutton on the toolbar.

## OPERATION: Edit Menu

There are two menu title items that are command functions, the FILE and **EDIT** menu title.

### Clear

This command removes all text from the edit field and leaves the edit field clear.

### Cut

This command cuts all, or a portion of the edit field that is selected by highlighting with the mouse or cursor, to the clipboard.

### Copy

This command copies all, or a portion of the edit field that is selected by highlighting with the mouse or cursor, to the clipboard.

### Paste

This command inserts the text contents of the Clipboard into the edit field, up to 255 characters in length. The paste command can assist the editing techniques with the cut and copy command to form a mini editor in the edit field.

### Unformatted

This command provides an unformatted numerical output of conversions, the greatest amount of numbers before and after the decimal.

### Standard

This command provides standard notation numerical output of conversions, places the thousands separator and provides two places to the right of the decimal.

### 3 digit

This command provides a standard notation like numerical output of conversions, and provides three places to the right of the decimal.

### 4 digit

This command provides a standard notation like numerical output of conversions, and provides four places to the right of the decimal.

### Scientific

This command provides a scientific notation numerical output of conversions, and provides conversions as powers of ten, especially helpful when very large or very small numbers are present.

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## OPERATION: Measurement Systems

### MEASUREMENT SYSTEMS

There are three major systems of measurement units in wide use: U.S. Customary System, the British Imperial System, and International(Metric) System.

The fundamental quantities of each system, together with their relationships to derived units within the same system and conversion to similar quantities in other system, are conveniently assembled in Unit - Pro.

Measurement of a quantity implies that a number is assigned to represent its magnitude. Usually the assignment can be made by simple comparison. The magnitude of the quantity is compared to a standard quantity, the magnitude of which is arbitrarily chosen to have the measure 1.

Quantities having a scale of measurement chosen in this way, arbitrarily and independently of the scales of other quantities are called fundamental. All other quantities are measured in units defined in relation to or derived from, fundamental quantities. The foot, defined as 1/3 of a yard, is an example of a derived unit. Another example is provided by the relationship between the weight and mass of a body. In the equation  $W = mg$ .  $W$  is the weight,  $m$  the mass, and the  $g$  the acceleration of gravity at the place where the body is located. The units for  $g$  are derived units, given in terms of the fundamental quantities length and time. Thus, if mass is chosen as a fundamental quantity, the units for weight follow naturally from the above equation and are derived units. [Return to Main Menu](#)

There is an important distinction between a unit of measurement and a standard of measurement. A unit of measurement is a precisely defined quantity in terms of which the magnitudes of all other quantities of the same kind can be stated. A standard of measurement is an object which, under specified conditions, serves to define, represent, or record the magnitude of a unit.

In the U.S. Customary System, the fundamental units are the yard and the (avoirdupois) pound. There are no primary standards as such in the U.S. System. The fundamental units are defined in terms of standards used in the Metric System. The U.S. System has its origins in the British System, but they are not identical.

The fundamental units in the British Imperial System also are the yard and the pound. Until 1959, these were defined not by reference to a Metric standard, as in the United States, but by reference to primary standards created specifically for that purpose. In that year, by agreement between the United States and the British Commonwealth, the International Yard and the International Pound were defined in terms of the Metric standards in the U.S. Customary System.

There are no significant differences between the U.S. and British systems. In the British System the units of dry measure (capacity) are the same as those of liquid measure. In the U.S. System they are not. [Return to Main Menu](#)

The Metric System is the system used in most of the civilized world, and the one used almost exclusively for scientific work. With the addition of units of time (the second), electric current (the ampere), temperature (kelvin or alternatively degree Kelvin), and luminous intensity (candela), the Metric System provides a complete coherent system of units used for all physical measurements. It is called the International System of Units and its units are called **SI units**. The International System was adopted for scientific use by the U.S. National Bureau of Standards in February 1964 and is now known as the National Institute of Standards and Technology (NIST).

The fundamental units of the Metric System are the meter and the kilogram. The meter was defined in 1960 by the Eleventh General Conference on Weight and Measures to be equal to 1,650,763.73 wavelengths of the orange-red radiation in vacuum of krypton 86.

The International Kilogram is a standard of mass. Consequently, units such as the pound and gram derived from it should be regarded as units of mass. In common practice, however, the terms kilogram, pound, gram etc. are used to designate the weights of these masses. This is permissible

because equal masses have equal weights under identical conditions. The Metric System is a decimal system, that is, one in which all derived units are multiples of ten.

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## MEASUREMENT SYSTEMS

<u>QUANTITY</u>	<u>METRIC-MKS</u>	<u>METRIC-CGS</u>	<u>ENGLISH</u>
Length	Meter	Centimeter	Foot
Mass	Kilogram	Grams	Slug
Time	Second	Second	Second
Charge	Coulomb	Statcoulomb	none
Linear velocity	Meter/second	Centimeter/second	Foot/second
Angular velocity	Radian/second	Radian/second	Radian/second
Momentum	Kilogram-meter/sec	Gram-centimeter/sec	Slug-foot/second
Linear acceleration	Meter/sec/sec	Centimeter/sec/sec	Foot/sec/sec
Angular acceleration	Radian/sec/sec	Radian/sec/sec	Radian/sec/sec
Force	Newton	Dyne	Pound
Work	Newton-meter	Dyne-centimeter	Foot-pound
Energy	Joule	Erg	Foot-pound
Power	Watt	Erg/second	Horsepower
Gravitational field	Newton/kilogram	Dyne/gram	Pound/slug
Current	Ampere	Statampere, abampers	none
Electric field	Volt/meter	Statvolt/centimeter	none
Potential	Volt	Statvolt	none
Voltage	Volt	Statvolt	none
Frequency	1/second	1/second	1/second
Period	Second	Second	Second
Permittivity of space	Coulomb squared per Newton-meter squared	none	none
Conductivity	Mho/meter	none	none
Resistivity	Ohm-meter Mho	Statohm-centimeter none	none none
Capacitance	Farad	none	none
Electric susceptibility	Volt-meter	none	none
Permittivity	Farad/meter	none	none
Pole strength	Ampere-meter	Abampere-centimeter	none
Magnetic induction	Weber/meter	Gauss	none
Permeability	Kilogram-meter per coulomb squared	none	none
Magnetic flux	Weber	none	none
Relative permeability	Ukn	none	none
Magnetic susceptibility	Ukn	none	none
Inductance	Henry	none	none
Mutual inductance	Henry	none	none
Mobility	Meter squared per volt-second	none	none

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## OPERATION: Tools

### Getting around UNIT - PRO

You can select menu titles tools in the OPERATION in either of two ways:

1. Selecting on Menu Titles and the menu items to start a conversion.
2. Selecting a function on the tool bar

#### Menu Area

The menu area consists of the menu bar which contains all of the menu titles for that page. A mouse click on a menu title will expose a menu that contains a listing of menu items that you may select for a conversion by simply selecting a menu title from the menu bar with the mouse by clicking once or if the title has an underlined letter (then select the ALT key + the letter that is underlined) and a menu appears with a list of menu items. Just highlight the menu item of interest and select enter or a mouse click, will cause the data input box to be data displayed. Just enter the numeric value you wish to convert. You may enter the number in any numeric format, even scientific notation, and then select enter. You will see all the values converted from the number you entered. .



#### Exit Pushbutton

To exit the conversion program, a simple mouse click on the Exit Pushbutton (Ex). You may exit the program from either menu.



#### Printer Pushbutton

The printer icon is the pushbutton you use to print the list of conversion you have created, to print to the default printer. The entire list of all conversions will print if there is a conversion displayed. If there is no conversion displayed and the printer is on you will print: text1, and waste a sheet of printer paper.



#### Clear Pushbutton

The clear pushbutton clears all of the text from the edit field. When your make a conversion and place the cursor on one of the conversion outputs and click once with the left mouse button, the conversion of interest is highlighted, and is automatically displayed in the edit field above the conversion window. You may remove the entire line from the edit field by selecting the clear pushbutton. When proficiency abounds, you may use the edit field as a mini editor to add as well as change text within the edit field. If you create a line of text just the way you want it DO NOT click on the clear pushbutton, it removes the entire text from the edit line. To remove parts or the line, highlight the parts to remove and press delete on the keyboard, only what you highlighted will be removed.



#### Next Menu

The Nm pushbutton will place you on the next page for more Conversions.



#### Cut Pushbutton.

The scissors icon is the cut pushbutton and is use to cut whatever is displayed on the edit field to the clipboard. The purpose of this provide the user a capability of making a conversion selecting a particular conversion by mouse clicking, which places it on the edit field and the cutting it to the clipboard for use

by other programs such as a word processor. This is a handy feature if your word processor and the conversion program are both active, thus allowing you to switch from one to the other back and forth, cutting and pasting conversions into your documents, without the need of writing the conversions.



### **Copy Pushbutton**

The pair of pages or two pages icon is the copy pushbutton which allows the edit field to be copied to the clipboard for future use by the operator, if there is a need to copy a conversion and then paste the clipboard data into another program.



### **Paste Pushbutton**

The clipboard with a page icon that allows text that is on the clipboard to be placed into the edit field. Only 256 characters can be written into the edit field



### **U Formatted Output**

The U pushbutton is for unformatted output of the displayed conversions. This format is the default format you will see when you make a conversion, unless you select one of the other output formats. The unformatted output provides all numbers in the output with no commas and no predefined number of digits to the right or to the left of the decimal place. This is the default format



### **S Standard Notation**

The S pushbutton is for standard notation which formats the output with a thousands separator and two digits to the right of the decimal point



### **3 Three Places to the right of the Decimal**

The 3 pushbutton is for three fixed digits to the right of the decimal point, even if they are three zero's



### **4 Four Places to the right of the Decimal**

The 4 pushbutton is for four fixed digits to the right of the decimal point, even if they are four zero's .



### **10<sup>x</sup> Scientific Notation**

The 10<sup>x</sup> pushbutton is for scientific notation which formats the output to one (between 1 and 10) digit fixed to the left of the decimal point, two digits to the right of the decimal point and uses powers of ten to demonstrate the power of Unitpro.



### **B Bold Text**

The B pushbutton allows the user the change between normal and bold text in the conversion field. Bold is the default position of this pushbutton, To change to normal text just click on the B pushbutton.

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## OPERATION: Basic Units

### A VIEW OF BASIC SI UNITS

#### QUANTITY

Length  
Mass  
Time  
Electric current  
Temperature  
Amount of substance  
Luminous intensity

#### QUANTITY

Plane angle  
Solid angle

#### QUANTITY

Frequency  
Force  
Pressure, stress  
Energy; work; quantity of heat  
Power; radiant flux  
Electric charge; quantity of electricity  
Electromotive force; electric potential, potential difference  
Capacitance  
Electric resistance  
Conductance  
Magnetic flux  
Magnetic flux density  
Inductance  
Illuminance

#### QUANTITY

Area  
Volume  
Speed; velocity  
Acceleration  
Wave number  
Density  
Current density  
Magnetic field strength  
Concentration (of amount of substance)  
Activity (radioactive)  
Specific volume  
Luminance

#### BASIC SI UNITS

**METER**  
**KILOGRAM**  
**SECOND**  
**AMPERE**  
**KELVIN**  
**MOLE**  
**CANDELA**

#### SI SUPPLEMENTARY UNITS

Radian  
Steradian

#### SI DERIVED UNITS WITH SPECIAL NAMES

hertz(Hz)  
newton(N)  
pascal (Pa)  
joule (J)  
watt(W)  
coulomb (C)  
volt (V)  
  
farad (F)  
ohm(omega)  
siemens(S)  
weber(Wb)  
tesla(T)  
henry(H)  
lux(lx)

#### SI DERIVED UNITS EXPRESSED IN TERMS OF BASE UNITS

square meter  
cubic meter  
meter per second  
meter per second squared  
1 per meter  
kilogram per cubic meter  
ampere per square meter  
ampere per meter  
mole per cubic meter  
1 per second  
cubic meter per kilogram  
candela per square meter

**QUANTITY**

Dynamic viscosity  
Moment of force  
Surface tension  
Heat flux density  
Heat capacity entropy  
Specific heat capacity  
Thermal conductivity  
Energy density  
Electric field strength  
Electric charge density  
Electric flux density  
Permittivity  
Permeability  
Molar energy  
Molar entropy; specific heat

**SI DERIVED UNITS EXPRESSED BY  
MEANS OF SPECIAL NAMES**

pascal second  
meter newton  
newton per meter  
watt per square meter  
joule per kelvin  
joule per kilogram  
kelvin  
joule per cubic meter  
volt per meter  
coulomb per cubic meter  
coulomb per square meter.  
farad per meter  
henry per meter  
joule per mole  
joule per mole kelvin

**QUANTITY**

Angle  
Angular acceleration  
Angular frequency  
Angular momentum  
Angular velocity  
Charge density  
    Line  
    Surface  
    Volume  
Conductivity  
Electric dipole moment  
Electric flux  
Magnetic dipole moment  
Moment of inertia  
Momentum  
Period  
Torque

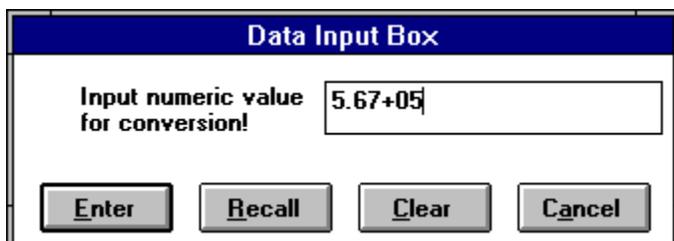
**OTHER SI DERIVED UNITS  
EXPRESSED BY MEANS OF SPECIAL  
NAMES**

radian  
radian/s/s  
radian/s  
kg . sq.m/s  
radian/s  
  
C/m  
C/sq. m  
C/cubic m  
1 ohm . m  
C . m  
V . m  
N .m/T  
kg sq. m  
kg .m/s  
s  
N . m

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## OPERATION: Data Input Box

The data input box is consistent for all single input conversions. The numeric input window, is where you can enter any numeric value from the number keys. Once you have entered a value, press enter on the keyboard, Alt key + E, or left mouse click on the enter button. The conversions will be displayed on the screen Status Area. To make another conversion select the menu title and menu item, enter a different value or select the exact last value by left mouse click on the recall button or Alt + R and then select enter for the conversion. You may clear the contents of the numeric input box by selecting the clear button or cancel the current operation by selecting the cancel button.



Scientific notation may be used as an input alternative instead of regular numbers. Any legitimate number can be entered. The numeric input window will accept any text but will give an error when you select enter without a proper numeric value. The Clear button will clear the numeric input window of data so correct numbers can be entered.

### # OPERATION: Conversion Status Field

Displays the entire lists of conversions, if the list is too long to display all of the conversions, the scroll bars will automatically become available.

## OPERATION: Status Area

The Conversion Status Field is the part of Unit - Pro that displays all of the conversion possibilities programmed into the menu item selected. Some of the menu items have much more conversion relationships than others. In the event that there are more conversions created, than the Conversion Status Field can display, a set of scroll bars will be displayed automatically on the right side of the Conversion Status Field. This allows access of all conversions.

The Conversion Status Field has four sections:

### Tool Bar

The top part of the Conversion Status Field contains the tool bar, which provides user selections of exiting the program, printing, changing to next menu, cut copy and paste, output formatting, functions, as well as changing the appearance of text with Bold to normal.

### Edit Field

Displays the default message :**With the cursor, select your working conversion.** After a conversion is made and a conversion is highlighted in the conversion status field, that highlight area is also displayed in the edit field.

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## Conversion Status

Displays all of the conversions related to the menu item selected. In the event that there are more conversions created, than the Conversion Status Field can display, a set of scroll bars will be automatically displayed on the right side of the Conversion Status Field

Status Bar

Automatically displays a system clock and date function on the left side of the bar and provides a tracking function of the last selection the user made, on the right side of the status bar.

## OPERATION: Tool Bar

The Tool Bar icons represent the user functions, are grouped together to be useful to the operator.



The first group of toolbar icons is more miscellaneous than the other groups and contains the pushbutton for exit exiting, printer for printing, clear clearing the edit field, previous menu (page) and next menu (page). The second group of toolbar icons is for cut cutting, Copy copying and paste pasting information to and from the clipboard. The third group of toolbar icons is for numerical output, formatting. Provides unformatted (default), standard notation, three and four digits to the right of the decimal point and Scientific Notation. The last button is for changing the displayed text in the edit and conversion status fields from normal to bold text. As can be seen the B pushbutton is pushed in, indicating that bold text is selected (which is true because bold is the default selection).

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## CONVERSION: MOUSE

### **MOUSE INSTRUCTIONS - Step by Step procedures**

#### **Review of Toolbar**

The toolbar allows the operator the following options:

- Exit the **Unit - Pro** program.
- Printer Prints the entire conversion status field.
- Clear Clears the edit field.
- Go to the next menu .
- Cut all of the edit field to the clipboard, leaving the edit field empty.
- Copy the edit field to the clipboard, leaving the edit field with data.

- g. Paste the contents of the clipboard to the edit field.
- h. Selecting the Unformatted button for unformatted output (default).
- i. Selecting the Standard button for standard notation (showing thousands separator)
- j. Selecting the Three button for three places to the right of the decimal.
- k. Selecting the Four button for four places to the right of the decimal.
- l. Selecting the  $10^x$  Scientific Notation button
- m. Selecting the Bold button for bold text (default - button depressed)

- (A) Select a menu title from the menu bar by placing the mouse pointer the item of interest. Clicking once with the left mouse key will cause a drop down menu to appear. Place the mouse pointer on the menu item, click once.
- (B) The above action will cause the Data Input Box to be displayed, ready for numeric input. Notice a flashing vertical line in the data input window, using the keyboard enter any number, large or small (such as .00023456 or 1098909874.787756) up to 255 characters on the same side of the decimal point. Very large or very small numbers can be entered in scientific notation such as (3.4567e-18 or 4.56987e21) and then enter.
- (C) The conversion status field displays all conversions applicable for the menu item selected and value entered The conversion list is displayed in alphabetical order top to bottom for ease of finding the conversion of interest. If there are more conversion than display space, a set of scroll bars are automatically displayed on the right side of the conversion status field, indicating there are more conversions to be observed. Simply slide down the button with the mouse pointer to view the remaining conversions.
- (D) The conversion status field is defaulted to display unformatted numeric output. This is because there is a wide range of conversion we deal with and display them all at once, some are very small numbers and other are very large numbers. Depending on the menu item selected and the number entered there will be zero's displayed for the conversions in all other output formats, except for scientific notation.
- (E) To activate the edit field place the mouse pointer on any of the conversions listed and click once. Notice that the conversion is highlighted in the conversion status field and the edit field
- (F) The edit field can be use as a mini editor by placing a conversion there and adding narrative to the edit field. **FOR EXAMPLE: Select a conversion with the mouse in the conversion status field, the edit field creates a duplicate of that highlighted conversion. Pressing the cut button, cut the edit field to the clipboard and empties the edit field, move the mouse pointer to the title of the conversion (top of conversion status field) click the mouse (highlighted) and it now appears in the edit field, move the pointer to the end of the text and click once removes the highlight and the cursor if a flashing vertical line (this is movable with the mouse by clicking another area) and then select the paste button. The clipboard data that was previously cut is now put at the end of the last edit field. a mini editor. Text can be further added of removed until the edit field is ready for cutting or copying to the clipboard. When ready using the mouse pointer go to the end of the edit field, hold the left mouse button and swipe (highlight) the area (continuously only)and then press the cut or the copy pushbutton. The edit field has been placed on the clipboard ready for pasting into other application programs.**
- (G) When ready to make another conversion, select a title from the menu bar click once, then select the menu item from the drop down menu, click once. The Data Input Box appears, if the last number is desired for this conversion simply select the recall button and the last number entered will be displayed and then select enter to create another set of conversions. If the number displayed is not what you want to enter press the clear button, not to worry the previous number is still available for recall. The recall button is very useful, especially for long numbers. The recall function holds the last number that was entered, until a new number is entered and then that number is the recall

number. The cancel button will cancel the operation and returns to the start state of the conversion process.

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## CONVERSION: Keyboard

### **KEYBOARD INSTRUCTIONS - Step by Step procedures**

**To operate Unit - Pro without a mouse is not difficult, there is loss of functions .... primarily the toolbar can not be activated and therefor the status bar will not indicate any toolbar functions. The time and date is always functional.**

- (A) To select a menu title from the menu bar start by using the ALT-key + any letter that is underlined. The drop down menu can be displayed by pressing the up or down arrow keys, the enter keys. Changing to a different menu title by using the arrow keys to get around. When the conversion of choice is reached just press the enter key.
- (B) The above action will cause the Data Input Box to be displayed, ready for numeric input. Notice a flashing vertical line in the data input window, using the keyboard enter any number, large or small (such as .00023456 or 1098909874.787756) up to 255 characters on the same side of the decimal point. Very large or very small numbers can be entered in scientific notation such as (3.4567e-18 or 4.56987e21) and then enter.
- (C) The conversion status field displays all conversions applicable for the menu item selected and value entered The conversion list is displayed in alphabetical order top to bottom for ease of finding the conversion of interest. If there are more conversion than display space, a set of scroll bars are automatically displayed on the right side of the conversion status field, indicating there are more conversions to be observed. Simply slide down the button with the mouse pointer to view the remaining conversions.
- (D) The conversion status field is defaulted to display unformatted numeric output. This is because there is a wide range of conversion we deal with and display them all at once, some are very small numbers and other are very large numbers. Depending on the menu item selected and the number entered there will be zero's displayed for the conversions in all other output formats, except for scientific notation.
- (E) To activate the edit field press the up or down arrow keys, and the conversion status field and the edit field are both highlighted with the same conversion. Move to the conversion desired for the edit field. Cut, copy and paste are available under the FILE menu title.
- (F) The toolbar isn't accessible without a mouse.
- (G) The edit field can be use as a mini editor by placing a conversion there and adding narrative to the edit field. **FOR EXAMPLE: Select a conversion with the arrow keys in the conversion status field, the edit field creates a duplicate of that highlighted conversion. Selecting the cut menu item from the drop down menu of the FILE menu title, cut the edit field to the clipboard and empties the edit field, moving the arrow keys to the title of the conversion (top of conversion status field) press the right or left arrow keys will unhighlight the edit field, allowing the cursor to be move anywhere in the edit field. Move the cursor to the end of the text and select paste from the FILE drop down menu item. The clipboard data that was previously cut is now put at the end of the last edit field. a mini editor. Text can be further added or removed until the edit field is ready for cutting or copying to the clipboard. When ready using the arrow keys or the home or end keys go to the end of the edit field and press the shift key and right or left arrow keys to highlight the edit field or use the shift and end keys together for a fast highlight the area (continuously only)and then select the the cut or the copy menu item under FILE. The edit field has been placed on the clipboard ready for pasting into other application programs.**
- (H) When ready to make another conversion, select a title from the menu bar as above, enter when the conversion item click once, then select the menu item from the drop down menu, click once. The

Data Input Box appears, if the last number is desired for this conversion simply select the recall button and the last number entered will be displayed and then select enter to create another set of conversions. If the number displayed is not what you want to enter press the clear button, not to worry the previous number is still available for recall. The recall button is very useful, especially for long numbers. The recall function holds the last number that was entered, until a new number is entered and then that number is the recall number. The cancel button will cancel the operation and returns to the start state of the conversion process.

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## CONVERSION: Options Menu

There are several variants to data input boxes, many input forms will have more than one user input for special calculations such as in the financial area or in problem solving. The same conversions apply as with the single input data box except that to get around the various input windows simply press the tab key until the vertical cursor indicates what window it is in. Place the appropriate information in the appropriate box and Unit - Pro will provide the correct response.

### Non-numeric error

This command displays all of the icons listed in the Icons list box in the scrollable Non-numeric window to the right.

## CONVERSION: Error Handling

### ERROR HANDLING ROUTINES

There are limitations when dealing with numbers especially very large or very small values. The limitations placed in Unit - Pro deals with the magnitude of powers to the 308th in the positive direction  $2.5E308$  and in the negative direction of minus 308  $(-308) 2.5E-308$ . These very large numbers may cause an out of range or overflow condition and may boot you out of the program. An example is on page 3 "Numbers" -> Conversions, the input form cautions not to exceed 143 input or an error will occur the reason is raising a number to ^ itself (input 143) =  $1.63325297297^{143}$

## CONVERSION: Non – Numeric



**This message box will be displayed when a non-numeric value is entered into the Data Input Box and enter is pressed.**

The program will not allow this input for a conversion. Any positive or negative number up to 255 digits may be entered. Scientific notation may also be entered if the number is very large or very small. The conversion program will allow numbers such as .000002334567948 or 2.334E-15, 3495867293.98675449 and 5678e12, 3.456754e12 or 3.456754 e-25. The e in scientific notation may be either (E or e). There are several ways you can enter a number but not a letter.

There is always an exception to the rule and Unit - Pro is no different, and that is for the ASCII code conversion, upper and lower case letters can be entered and the ASCII code for that letter is returned.

## All about UNIT - PRO:



### **KISS (Keep It Simple Stupid!) Our methodology**

**Unit - Pro** is the creation of Southwest Technical Services (STS). The goals in the design and operation of Unit - Pro were to provide the maximum conversion capability with as little effort as possible. That goal has been met. Unit - Pro is very easy to operate and does not need a user manual to get answers to the most complex conversion problems.

When you first enter into the conversion world, the thought of "conversions" can seem quite confusing, however with Unit-Pro, it is very enjoyable because it is simple to use, as well as very powerful! Unit - Pro is a strong training aid for those who want to learn. The acronyms and glossaries have valuable information on definitions, uses and measurement systems.

There are thousands of conversions within Unit - Pro from the very common to the not so common, all are as current as the references use in compiling the formulas. Unit - Pro did not include world wide conversions (country dependent) in this version of the program as well as some disciplines may not be fully covered.

We at STS encourage all types of feedback. STS would like to become a single source for all proven standard conversions and even some not so standard conversions in one software package. The vast majority of functions in Unit - Pro are straight forward numeric conversions between like measurements such as length, volume, mass, time, speed, density and flow to name just a few. With the amount of formulas programmed into Unit - Pro, there is always the possibility of human error in quality assurance testing and not realize there is an error. In the unlikely event that a problem or a suspected incorrect formula or conversion is used, please provide STS with all the information so we can correct it. In addition, if there are any areas or disciplines that were not addressed fully please let us know, provide the source material or reference for our review.

Many areas other than straight conversions are included such as financial functions, trigonometric functions, geometric functions, base systems, meteorological information, problem solving e.g. quadratic equations, cooking and baking conversions, and many many others.

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## **OPERATION:**

## **Cost, Registration and upgrades of Unit - Pro**

The cost for Unit - Pro is twenty (\$20.00 US). It is priced for mass distribution and affordable by everyone.

It is important to be a registered user of Unit - Pro for changes and upgrades that will be coming in the future. Please take time to fill in the registration form in the HELP topic and print it out and mail to the address on the registration form.

It is anticipated that the next upgrade will be in 2016/2017.

Visit: [www.unitpro.com](http://www.unitpro.com)

### **Addresses:**

Southwest Technical Services  
310 Crawford Dr.  
Victoria, TX 77904  
ATTN: UNIT - PRO

Technical Support PH: 1 (361) 676-2839  
email address: [sales@unitpro.com](mailto:sales@unitpro.com)

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## Glossary...A\_M

Term	Definition
<b>Absolute</b>	
<b>Acceleration</b>	The rate of change of being accelerated.
<b>Acceleration of gravity</b>	The acceleration of freely falling bodies under the influence of terrestrial gravity, equal to 980.665 centimeters/second squared (cm/sec <sup>2</sup> ).
<b>Acre</b>	A unit of area, used in land measurements equaling 43,560 square feet.
<b>Acre-foot</b>	The volume of water (43,560 cubic feet) that will cover an area of one acre to a depth of one foot.
<b>Angle</b>	The figure formed by two lines or two planes diverging from a common point. The rotation required to superimpose either of two such lines or planes on the other.
<b>Angstrom</b>	A unit of length equal to one hundred-millionth (ten to the eighth power 10 <sup>-8</sup> ) of a centimeter, also referred to as an angstrom unit. (.00000001).
<b>Area</b>	The measure of a planar region or the surface of a solid.
<b>ASCII</b>	The American Standard Code for Information Interchange is a 7 or 8 bit code representing control characters, letters, numbers and special graphic characters.
<b>Astronomical Unit</b>	A unit of length used in measuring astronomical distances, equal to the mean distance of the earth from the sun, approximately 93 million miles.
<b>Astronomy</b>	The scientific study of the universe beyond the earth.
<b>Atmosphere</b>	A unit of pressure equal to 1.01325x ten to the fifth power(10 <sup>5</sup> ) Newton's per square meter.
<b>Bar</b>	A unit of pressure equal to (ten to the fifth ) Newton's per square meter or .98697 standard atmospheres.
<b>Barometric Pressure</b>	
<b>Barrel</b>	Any of various units of volume or capacity. In the US it varies, as a liquid measure, from 31 to 42 gallons as established by law.
<b>Bit</b>	[BI(nary)(digi)T] A single character of a

	language having just two characters such as 0 and 1, Binary digits.
<b>British Imperial System</b>	Of pertaining to or characteristic of Great Britain system of measurements. A reference of measurement standards of capacities of different quantities but having identical names.
<b>British Thermal Unit (BTU)</b>	A quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit.
<b>Bushel</b>	A unit of volume or capacity in the US used in dry measurement and equal to 4 pecks or 2,150.42 cubic inches.
<b>Cable</b>	A unit of nautical length equal to 720 feet in the US and 608 feet in the British Imperial System.
<b>Calorie</b>	Any of several approximately equal units of heat, each measured as the quantity of heat required to raise the temperature of .1 gram of water by 1 degree centigrade from a standard initial temperature, especially from 3.98 degree C, 14.5 degree C, or 19.5 degree C at 1 atmosphere pressure. Also called gram calorie. The unit of heat equal to 1/100 the quantity of heat required to raise the temperature of 1 gram of water from 0 to 100 degrees centigrade at one atmosphere pressure. Also the unit of heat equal to the amount of heat required to raise the temperature of 1 kilogram of water by 1 degree centigrade at one atmosphere pressure, referred to as kilogram calorie. A unit of heat equal to 4.184 joules.
<b>Candela</b>	A unit of luminous intensity equal to 1/60 of the luminous intensity per square centimeter of a black body radiating at the temperature of solidification of platinum (2,046°degrees Kelvin) also called candle and standard candle.
<b>Capacitance</b>	The ratio of charge to potential on an electrically charged, isolated conductor. The ratio of the electric charge transferred from one to other of a pair of conductors to the resulting potential difference between them.
<b>Centi</b>	Indicated a hundredth 1/100 such as a centimeter = 1/100 of a meter.
<b>Charge</b>	To cause a formation of a net electric charge on or in a conductor.
<b>Charge density</b>	The electric charge per unit area or per unit

volume of a body or a region of space.

**Coulomb**

**Cubic**

Having three dimensions, having a volume equal to a cube whose edge is of a stated length (a cubic foot). Of the third power, order or degree.

**Current**

A flow of electric charge. The amount of electric charge flowing past a specified circuit point per unit time.

**Day**

The 24 hour period during which the earth completes one rotation on its axis.

**Deci**

Indicates one-tenth, 1/10, such as deciliter is 1/10 of a liter.

**Density**

The amount of something per unit measure, especially per unit length, area or volume.

**Dram**

A unit of weight in the US Customary System, an avoirdupois unit equal to 27.344 grains or .0625 ounce. A unit in the apothecary weight equal to 60 grams.

**Dyne**

A centimeter-gram-second unit of force equal to the force required to impart an acceleration of one centimeter per second per second to a mass of one gram.

**Electron volt**

A unit of energy equal to the energy acquired by an electron falling through a potential difference of one volt, approximately  $1.602 \times 10^{-19}$  joule.

**Energy**

The work that a physical system is capable of doing in changing from its actual state to a specified reference state.

**Energy density**

The energy per unit volume of a region of space.

**Erg**

A centimeter-gram-second unit of energy or work equal to the work done by a force of one dyne acting over a distance of one centimeter.

**Fahrenheit**

Of or pertaining to a temperature scale that registers the freezing point of water at 32°degrees f and the boiling point at 212°degrees f.

**Fathom**

A unit of length equal to six feet and used principally in the measurement and specification of marine depths.

**Fermi**

**Filed strength**

The effectiveness of a field of force at any

	point as measured by the force exerted on a unit entity subjected to the field at that point. Also called field intensity.
<b>Flow</b>	To move or run freely in the manner characteristic of a fluid.
<b>Flux</b>	A flow of matter or energy as a fluid or regarded as a fluid.
<b>Flux density</b>	The quantity of flux per unit area force.
<b>Foot</b>	A unit of length in the US customary and British Imperial Systems, equal to 1/3 yard or 12 inches.
<b>Foot candle</b>	The illumination of a surface one foot distance from a source on one candela, equal to one lumen per square foot. Also referred to as candle-foot.
<b>Foot lambert</b>	A unit of luminance equal to $1/\pi$ pi candela per square foot.
<b>Foot pound</b>	A unit of work equal to the work done by a force of one pound acting through a distance of one foot in the direction of the force.
<b>Foot poundal</b>	A unit of work equal to the work done by a force on one poundal acting through a distance of one foot in the direction of the force.
<b>Foot poundal</b>	A unit of work equal to the work done by a force on one poundal acting through a distance of one foot in the direction of the force.
<b>Force</b>	A vector quantity that tends to produce an acceleration of a body in the direction of its application.
<b>Furlong</b>	A unit for measuring distance equal to 1/4 mile or 220 yards.
<b>Gallon</b>	A unit of volume or capacity in the US customary system used in liquid measure equal to 4 quarts or 231 cubic inches or 277.42 cubic inches in the British Imperial System.
<b>Grain</b>	A unit of weight in the US Customary system, an avoirdupois unit equal to .002285 ounce or .036 dram.
<b>Gram</b>	A metric unit of mass and weight equal to 1/1000 , one thousandth (ten to the minus 3) of a kilogram.
<b>H<sub>2</sub>O</b>	The chemical make up of water.

<b>Heat</b>	A form of energy associated with the motion of atoms or molecules in solids and capable of being transmitted through solid and fluid media by conduction, through fluid media by convection
<b>Hectare</b>	A metric unit of area equal to 2.471 acres or 100 ares.
<b>Hg</b>	The symbol for the element mercury.
<b>Horsepower</b>	A unit of power in the US Customary system equal to 745.7 watts or 33,000 foot-pounds per minute
<b>Horsepower boiler</b>	
<b>Horsepower electric</b>	
<b>Horsepower mechanical</b>	
<b>Horsepower metric</b>	
<b>Horsepower water</b>	
<b>Hour</b>	1/24th part of a day, 60 minute intervals of time.
<b>Hundredweight</b>	A unit of weight in the US Customary system equal to 100 pounds, also called short hundredweight. In the British Imperial system equal too 112 pounds,, also called quintal.
<b>Impedance</b>	A measure of the total opposition to current flow in an alternating current circuit equal to the ratio of the rms. electromotive force in the circuit to the rms. current produced by it.
<b>Inch</b>	A unit of length in the US Customary and British Imperial System equal to 1/12th of a foot.
<b>Inductance</b>	A circuit element, typically a conducting coil, in which electromotive force is generated by electromagnetic induction.
<b>Jigger</b>	A measure of liquid, usually liquor holding approximately 1 1/2 ounces.
<b>Joules</b>	The International System unit of energy, equal to the work done when a current of 1 ampere is passed through a resistance of 1 ohm for 1 second. A unit of energy, equal to the work done when the point of application of a force of 1 Newton is displaced 1 meter in the direction of the force.
<b>Joules/g</b>	

<b>Joules/g.c</b>	
<b>Joules/kg</b>	
<b>Joules/kg.c</b>	
<b>Joules/kg.k</b>	
<b>Kelvin</b>	The unit of thermodynamics temperature equal to 1/273.16, an absolute scale where the zero point is -273.16 degrees Celsius.
<b>Kilo</b>	Indicates one thousand (1,000) as in 1,000 grams or 1 kilogram.
<b>Kilogram-calorie</b>	The unit of heat equal to the amount of heat required to raise the temperature of 1 kilogram of water by 1 degree Celsius at 1 atmosphere.
<b>Kilogram-meter</b>	A meter-kilogram second unit of work equal to the work performed by a one kilogram force acting through a distance of one meter.
<b>Kilowatt-hour</b>	The total energy developed by a power of one kilowatt acting for one hour.
<b>Lambert</b>	A unit of brightness equal to $1/\pi$ pi candle per square centimeter.
<b>Latent heat</b>	The quantity of heat absorbed or released by a substance undergoing a change of state, as by ice changing to water or water to steam.
<b>Leap year</b>	A year in the Gregorian calendar having 366 days with the extra day, February 29, intercalated to compensate for the quarter-day difference between an ordinary year and the leap year. Every year whose number is divisible by 4 is a leap year, with the exception of centennial numbers, which are leap years only divisible by 400.
<b>Light year</b>	A unit of length as measured by time it take light (that travels 186,000 miles per second) to travel in 1 year.
<b>Liter</b>	A metric unit of volume equal to a cubic decimeter, approximately 1.056 liquid quart or .908 dry quart.
<b>Long ton</b>	A unit of weight in the US Customary system an avoirdupois unit equal to 2240 pounds. Also referred to as a ton.
<b>Lumen</b>	The unit of luminous flux emitted in the International system equal to the luminous flux emitted in a solid angle of one

steradian by a uniform point source having an intensity of one candela.

**Lux**

The International system unit of illumination, equal to one lumen per square meter.

**Magnum**

A measure of liquid, usually liquor equaling approximately 2/5 of a gallon

**Mean**

As in arithmetic mean, a number obtained by dividing the sum of a set of quantities by the number of quantities in the set . Also called average.

**Meter**

The fundamental unit of length in the Metric system, equal to 39.37 inches. It was defined in 1790 as one ten-millionth (ten to the negative 7) of the earth's' quadrant passing through Paris but was redefined in 1960 as the length equal to 1,650,763.73 wave lengths in a vacuum of the orange-red radiation of krypton 86.

**Metric ton**

A unit of mass equal to 1000 kilograms or 2,204.6 pounds.

**Micro**

Indicates one-millionth (ten to the negative sixth) part of a unit in the metric or related measurement systems.

**Micron**

A unit of length equal to one-millionth (ten to the negative six) of a meter.

**Mile**

A unit of length equal to 5280 feet, 1760 yards or 1609.34 meters, used in the US and other English speaking countries, also called a statute mile.

**Milli**

Indicates one-thousandth (ten to the negative third) of a unit in the International System of measurements.

**Minute**

A unit of time equal to one-sixtieth of an hour or 60 seconds. A unit of angular measurement equal to one-sixtieth of a degree or to 60 seconds. Also referred to minute of arc.

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## Glossary...N\_Z

Term	Definition
<b>Nano</b>	Indicates one-billionth (ten to the minus 9th) of a specified unit such as nanometer.
<b>Newton</b>	In the meter-kilogram-second system the unit of force required to accelerate a mass on one kilogram, one meter per second per second, equal to 100,000 dynes.
<b>Nautical mile</b>	A unit of length used in sea and air navigation based on the length of one minute of arc of a great circle, especially an international and us unit equal to 1852 meters or 6,076 feet.
<b>Ounce</b>	A unit of weight in the U.S. Customary system, an avoirdupois unit equal to 16 drams or 437.5 grains. There are 16 ounces to the pound. A unit of apothecary weight equal to 480 grains or 1.097 avoirdupois ounces.
<b>Parsec</b>	A unit of astronomical length based on the distance from earth at which stellar parallax is one second of arc and equal to 3.258 light-years (1.919 time ten to the 13th miles).
<b>Peck</b>	A unit of volume or capacity in the U.S. Customary system used in dry measurement equal to 8 quarts or 537.605 cubic inches.
<b>Pennyweight</b>	A unit of troy weight equal to 244 grains, 1/20th of a troy ounce or approximately 1.555 grams.
<b>Pint</b>	A unit of volume or capacity in the U.S. Customary system used in liquid measure, equal to 16 fluid ounces or 28.875 cubic inches.
<b>Poise</b>	A centimeter-gram-second unit of dynamic viscosity equal to one dyne-second per square centimeter.
<b>Pound</b>	A unit of weight equal to 16 ounces or 7000 grains. Also called avoirdupois pound. A unit of apothecary weight equal to 5.760 grains or .823 avoirdupois.
<b>Poundal</b>	A unit of force in the foot pound second system of measurement, equal to the force required to accelerate a standard one pound mass one foot per second.
<b>PSI</b>	Pounds per square inch

**PSIA**

**PSIG**

**Quart**

A unit of volume or capacity in the U.S. Customary system, used in liquid measure, equal to two pints or 57.75 cubic inches. Used in dry measure, equal to two pints or 67.2 cubic inches. A unit of volume or capacity in the British Imperial System used in liquid and dry measure, equal to 1.201 US liquid quarts, 1.032 US dry quarts or 69.354 cubic inches.

**Radian**

A unit of angular measurement equal to the angle subtended at the center of a circle by an arc of length equal to the radius of the circle. Equal to  $360/2\pi$  degrees.

**Rankin**

The scale of absolute temperature using Fahrenheit degrees, in which the freezing point of water is 491.69 degrees and the boiling point of water is 671.69.

**Revolution**

An orbital motion about a point, 1 complete revolution equal to 360 degrees.

**Rod**

A linear measure equal to 5.5 yards, 16.5 feet or 5.03 meters, also referred to as "pole", British term is perch. A square perch or pole equal to 30.25 square yards.

**Scruple**

A unit of apothecary weight equal to 20 grains.

**Second**

A unit of time equal to 1/60th of a minute, a unit of angular measure equal to 1/60th of a minute of arc.

**Shot**

A unit designating chain length, US equal to 15 fathoms, British equal to 12.5 fathoms.

**Sideral day**

The time required for a complete rotation of the earth, measured as the interval between two successive meridian transits of the vernal equinox or 23 hours, 56 minutes, 4.09 second in units of mean solar time.

**Sideral time**

Time based upon the axial and orbital rotation of the earth with reference to the background of the stars.

**Sideral year**

The time required for one complete revolution of the earth about the sun, relative to the fixed stars or 365 days, 6 hours, 9 minutes, 9.54 seconds of mean solar time.

**Specific heat**

The ratio of the amount of heat required to

raise the temperature of a unit of mass of a substance by one unit of temperature to the amount of heat required to raise the temperature of a similar mass of a reference material, usually water, by the same amount.

<b>Square</b>	The product of a number multiplied by itself.
<b>Statute mile</b>	The standard mile, 5,280 feet.
<b>Tablespoon</b>	A cooking and baking measure equaling three teaspoons or four liquid drams.
<b>Teaspoon</b>	A cooking and baking measure equaling 1/3 teaspoon or 1 1/2 liquid drams.
<b>Ton</b>	A unit of weight in the U.S. Customary system, an avoirdupois unit equal to 2240 pounds. Also called a long tone. Also an avoirdupois unit equal to 2000 pounds called a short ton.
<b>Tropical year</b>	The time interval between two successive passages of the sun through the vernal equinox, the calendar year or 365.2422 mean solar days, also called solar year.
<b>Vernal equinox</b>	The point at which the ecliptic intersects the celestial equator, the sun having a northerly motion. The moment at which the sun passes through this point, about March 21, marking the beginning of spring.
<b>Voltage</b>	Electromotive force or potential difference, usually expressed, in volts.
<b>Volt-ampere</b>	A unit of electric power ratio equal to the product of one volt and one ampere, equivalent to one watt.
<b>Watt</b>	A unit of power in the Metric System equal to one joule per second.
<b>Watt-hour</b>	A unit of energy, especially electrical energy equal to the energy of one watt acting for one hour and equivalent to 3,600 joules.
<b>Week</b>	A period of seven days.
<b>Year</b>	The period of times as measured by the Gregorian calendar in which the earth completes a single revolution around the sun, consisting of 365 or 366 days. Also called calendar year.

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## Acronyms

<b>Term</b>	<b>Definition</b>
<b>abs</b>	absolute
<b>apoth</b>	apothecary
<b>atm</b>	atmosphere
<b>Btu</b>	British thermal unit
<b>cal</b>	calorie
<b>cgs</b>	centimeter-gram-second
<b>chem</b>	chemical
<b>cm</b>	centimeter
<b>cu</b>	cubic
<b>db</b>	decibel
<b>degree C</b>	degree Celsius
<b>degree F</b>	degree Fahrenheit
<b>degree K</b>	degree Kelvin
<b>degree R</b>	degree Rankin
<b>EM</b>	electromagnetic
<b>elec</b>	electric
<b>flu</b>	fluid
<b>ft</b>	foot or feet
<b>gal</b>	gallon
<b>gm</b>	gram
<b>H<sub>2</sub>O</b>	water
<b>Hg</b>	mercury
<b>hp</b>	horsepower
<b>hr</b>	hour
<b>IST</b>	International steam table
<b>kcal</b>	kilocalorie
<b>kg</b>	kilogram
<b>kgf</b>	kilograms force
<b>kw</b>	kilowatt
<b>lbf</b>	pounds force
<b>lbs</b>	pounds
<b>liq</b>	liquid
<b>ln</b>	logarithm (natural)
<b>log</b>	logarithm (common)

<b>mech</b>	mechanical
<b>min</b>	minute
<b>ml</b>	milliliter
<b>mm</b>	millimeter
<b>naut</b>	nautical
<b>oz</b>	ounce
<b>petro</b>	petroleum
<b>phys</b>	physics
<b>ppm</b>	parts per million
<b>psi</b>	pounds per square inch
<b>psia</b>	pounds per square inch absolute
<b>psig</b>	pounds per square inch guage
<b>sec</b>	second
<b>sq</b>	square

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