



CONSTRUCTION MASTER®

CONCRETECALC™ PRO

ADVANCED FEET-INCH-FRACTION CALCULATOR

Model 4225

Pocket Reference Guide



**CALCULATED
INDUSTRIES®**



**Insert This
Direction**

CONCRETECALC™ PRO

Designed for today's concrete professional, the all-new *ConcreteCalc Pro* adds even more power to the already powerful *Construction Master* line-up. Like earlier models, this calculator is so simple to use, even the novice user can easily solve dimension-related problems.

- *Solve Dimensional Math with Ease*
- *Dimensional Conversions*
- *Imperial/Metric Conversions*
- *Weight/Volume Conversions*
- *Rectangular Area/Volume Calculations*
- *Block Quantity Solutions*
- *Footing Volume Calculations*
- *Instant Square-Up (Diagonal) Solutions*
- *Drop Distance Calculations*
- *Circular Area and Circumference*
- *Arc Length Calculations*
- *Calculate Stair Risers, Treads, Stringers and Inclination Angle*
- *Material Estimations*
- *Paperless Tape*

TABLE OF CONTENTS

GETTING STARTED	1
Key Definitions.....	1
Preference Settings	11
Entering Dimensions	13
Conversions.....	14
Basic Math Operations	16
Percentage Calculations.....	17
Memory Operation.....	18
Paperless Tape	19
USING THE CONCRETECALC PRO ...	20
Length, Width, and Height Keys.....	20
Circle Calculations.....	23
Squaring-Up a Concrete Slab	26
Calculating Rebar	27
Calculating Loads	29
Blocks and Bricks	30
Polygon (Equal-Sided).....	31
Concrete Footing	32
Finding Weight Per Volume.....	33
Concrete Bags.....	33
Calculating Drop	34
Stair Calculations.....	36
APPENDIX	40
Accuracy/Errors	40
Battery and Auto Shut-Off	41
Default Settings	42
Area Formulas	43
Surface Area and Volume Formulas..	44
REPAIR AND RETURN.....	45
Warranty, Repair and Return Information.....	45
WARRANTY	46

GETTING STARTED

KEY DEFINITIONS

Basic Function Keys



Arithmetic operation keys.



Four-function (+, -, x, ÷) percent key.



Keys used for entering numbers.



Off Key — Turns all power off, clearing all non-permanent registers.



On/Clear Key — Turns on power. Pressing once clears the display. Pressing twice clears all temporary values.



Convert Key — Used with the dimensional keys to convert between dimensions or with other keys to access special functions.



Store Key — Used for storing values.



Recall Key — Recalls stored values.

Unit Keys

Yds

Yards Key — Enters or converts to *Yards*.

Feet

Feet Key — Enters or converts to *Feet* as whole or decimal numbers. Also used with the **Inch** and **/** keys for entering Feet-Inch values (e.g., **6 Feet 9 Inch 1 / 2**). Repeated presses during conversions toggle between Fractional and Decimal Feet.

Inch

Inch Key — Enters or converts to *Inches*. Entry can be whole or decimal numbers. Also used with the **/** key for entering fractional Inch values (e.g., **9 Inch 1 / 2**). Repeated presses during conversions toggle between Fractional and Decimal Inches.

/

Fraction Bar Key — Used to enter *Fractions*. Fractions can be entered as proper ($1/2$, $1/8$, $1/16$) or improper ($3/2$, $9/8$). If the denominator (bottom) is not entered, the calculator's fractional accuracy setting is automatically used.

m

Meters Key — Enters or converts to *Meters*.

Conv **7**

Centimeters — Enters or converts to *Centimeters*.

(Cont'd)

(Cont'd)

Conv **9**

Millimeters — Enters or converts to *Millimeters*.

Conv **2**

Acres — Enters or converts to *Acres*.

Length, Width and Height Keys

Length

Enters Length for calculation of Area or Volume.

Width

Enters Width and calculates Area, Square-up and perimeter.

Height

Enters Height and calculates Volume, wall Area and total room Area. This is a permanent entry; stored value holds when turned off.

Arc/Circle Keys

Arc

Arc — Calculates arc Length or degree, chord Length, segment Area, pie slice Area and segment rise.

Circ

Circle — Enters diameter and calculates circle Area and circumference.

Conv **Arc**

Radius — Enters or calculates circle radius.

Conv **Width**

Chord — Enters or calculates the chord Length of a circle segment.

Conv **Height**

Segment Rise — Enters or calculates the rise of a circle segment.

Construction Project Keys

Rebar

Rebar Key — Given stored or entered rebar inset, rebar size, rebar on-center spacing and entered Length and Width values calculates the following:

Press Result

1	Total Feet
2	Total Weight
3	Rebar Size
4	Rebar On-center
5	Rebar Inset
6	Stored Length
7	Stored Width

If you already know your total linear Feet of rebar, you can enter the Length to calculate the total Weight based on the Weight per Foot of the stored rebar size (e.g. **1 0 0 Feet Rebar Rebar**).

Conv Rebar

Inset — Stores rebar inset Default is 3 inches. Rebar inset is the spacing between the rebar and the perimeter of the forms or foundation.

Rebar Size

Rebar Size Key — Stores rebar size. Rebar size can be entered as a number for rebar sizes 3-11, 14, and 18 (e.g., **5 Rebar Size** for number 5 rebar), or as a decimal or fractional value not exceeding 6 Inches in diameter (e.g., **5 7 8 Rebar Size** for 5/8 Inch bar size). Default is number 5 (5/8").

Conv **Rebar Size**

Spacing — Stores rebar on-center spacing. Default is 18”.

Loads

Loads Key — Calculates number of loads for a given Volume or Length, Width, and Height (Depth) values and stored load size.

Stor **Loads**

Load Size — Stores load size. Load size must be entered as a cubic value (e.g., **8** **Yds** **Yds** **Yds** **Stor** **Loads**). The default size is 8 cubic Yards.

Conv **5**

Bags — Calculates number of concrete bags for a given Volume and stored bag size.

Stor **5**

Bag Size — Stores bag size (Volume per bag of concrete). Bag size must be entered as a cubic value (e.g., **6** **7** **Feet** **Feet** **Feet** **Stor** **5**). Default is 0.666667 cubic Feet per bag, based on a standard 80 pound bag.

Blocks

Blocks/Bricks — Calculates the number of concrete blocks required to fill a given Area. This key can also be used for calculating the number of “face” or “paver” bricks by storing a brick size (see **Block Size**).

Stor **Blocks**

Block Size — Stores the block size. Block size must be entered as a linear value or a square value. The default is 128 square Inches block Area and 16 Inches block Length.

*Note: For bricks, you may also enter a brick size using **Stor** **Blocks**. For example, when building with standard “face” bricks, store a brick size of 21 square Inches (e.g., **2** **1** **Inch** **Inch** **Stor** **Blocks**) or store 32 square Inches (e.g., **3** **2** **Inch** **Inch** **Stor** **Blocks**) for “paver” bricks. This is based on Modular U.S. brick size of 3-5/8 Inches x 2-1/4 Inches x 7-5/8 Inches, including 3/8 Inch mortar = 4 Inches x 2-5/8 Inches x 8 Inches.*

Sq-Up

Square-Up Key — Calculates the “Square-Up” (diagonal) Length given entered Length and Width values.

Drop

Drop Key — Calculates total drop (or fall) over an entered Length given, entered percentage drop, Inch per Foot drop, or degrees of drop. Continued presses will act as a “constant add,” for displaying successive drops.

Conv **8**

Board Feet — Enters or converts cubic values to board Feet.

Conv **Circ**

Column/Cone — Calculates the Volume and surface Area of a column and/or cone.

Ftg

Footing — Finds quantity of concrete, based on entered wall Length and stored footing Area.

Stor

Ftg

Footing Area — Stores footing Area. Footing Area must be entered as a square value (e.g., **2** **6** **4** **Inch** **Inch** **Stor** **Ftg**). The default footing is 264 square Inches.

Conv

Length

Polygon — Calculates full angle, bi-sect angle, side Length, perimeter and Area based on entered radius and number of sides.

Stair Layout Key

Stair

Given Height and/or Length and stored variables, calculates or displays:

Press	Result
1	Riser Height (R-HT)
2	Number of Risers (RSRS)
3	Riser Overage/ Underage (R+/-)
4	Tread Width (T-WD)
5	Number of Treads (TRDS)
6	Tread Overage/ Underage (T+/-)
7	Stairwell Opening (OPEN)
8	Stringer Length (STRG)
9	Angle of Incline (INCL)
10	Stored or Calculated Run (RUN)
11	Stored or Calculated Rise (RISE)
12	Stored Desired Riser Height (R-HT)
13	Stored Desired Tread Width (T-WD)
14	Stored Headroom (HDRM)
15	Stored Floor Thickness (FLOR)

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Conv **Stair**

Riser Limited — Calculates *riser Height* and other stair values if you're limited by local code. The calculated *riser Height* will never exceed the *stored* desired *riser Height*.

STAIR DEFAULT VALUES

- 7-1/2" Desired Riser Height
- 10" Desired Tread Width
- 10" Floor Thickness
- 6'8" Headroom

Customizable Stair Settings

Stor **7**

Stores Desired Riser Height.

Stor **9**

Stores Desired Tread Width.

Stor **8**

Stores Floor Thickness.

Conv **Stor** **Stor**

Sets Headroom.

Stor **Stor**

Miscellaneous Functions

←

Backspace Key.

Rcl **=**

Paperless Tape.

Conv **Stor**

Preference Settings.

Conv **÷**

(1/x) Reciprocal — Finds the reciprocal of a number (e.g., **8** **Conv** **÷** 0.125).

Conv **X**

Clear All — Returns all stored values to the default settings. (Does not affect Preference Settings.)

Conv	\pm	(+/-) Toggle.
Conv	π	Pi (π) 3.141593.
Conv	\square	Converts between D:M:S and decimal degrees.
Conv	%	x^2 — Squares the value in the display.
Conv	$\sqrt{}$	(\sqrt{x}) Square Root.
Conv	$\times 10^y$	Exponential Notation ($x10^y$).
Conv	0	Total Cost (based on entry of per unit cost).
Stor	0	Weight per Volume — Stores a new <i>Weight per Volume</i> value.

Note: After entering a value and pressing **Stor** 0, continue pressing the 0 digit key until you've reached the desired *Weight per Volume* format. To recall your setting, press **Rcl** 0.

Conv	6	Tons — Enters or converts to Tons.
Conv	4	Pounds — Enters or converts to Pounds.
Conv	3	Metric Tons — Enters or converts to Metric Tons.
Conv	1	Kilograms — Enters or converts to Kilograms.
M+		Memory +.
Conv	M+	(M-) Memory Minus.
Stor	1	(M1) Storage Register.
Stor	2	(M2) Storage Register.
Stor	3	(M3) Storage Register.
Conv	Rcl	Clear M+.
Rcl	Rcl	Recall and Clear M+.
Rcl	M+, 1, 2 or 3	Recall M+, M1, M2 or M3.

PREFERENCE SETTINGS

Press **Conv**, then **Stor**, then keep pressing **Stor** to toggle through the main settings. Press the **+** key to advance within sub-setting. Use the **-** key to back up. Press any key to exit Preferences.

PRESS

Conv AND:	SETTING--FUNCTION
<i>First press</i>	<i>Fractional Resolution:</i>
of Stor :	--1/16
+	--1/32
+	--1/64
+	--1/2
+	--1/4
+	--1/8
+	--1/16 (<i>repeats options</i>)
<i>Second press</i>	<i>Area Displays:</i>
of Stor :	--Std.
+	--0. SQ FEET
+	--0. SQ YD
+	--0. SQ M
+	--Std. (<i>repeats options</i>)
<i>Third press</i>	<i>Volume Displays:</i>
of Stor :	--Std.
+	--0. CU YD
+	--0. CU FEET
+	--0. CU M
+	--Std. (<i>repeats options</i>)

(Cont'd)

(Cont'd)

PRESS:	SETTING--FUNCTION
<i>Fourth press</i>	<i>Headroom Height Setting:</i>
of Stor :	--6 FEET 8 INCH
+ *	--6 FEET 9 INCH
- *	--6 FEET 8 INCH
<i>*Press + to increment or - to decrement by one inch.</i>	
<i>Fifth press</i>	<i>Exponential Mode:</i>
of Stor :	--OFF
+	--On
+	--OFF (repeats options)
<i>Sixth press</i>	<i>Meter Linear Displays:</i>
of Stor :	--0.000 M
+	--FLOAt M (floating point)
+	--0.000 M (repeats options)
<i>Seventh press</i>	<i>Decimal Degree Displays:</i>
of Stor :	--0.00°
+	--FLOAt (floating point)
+	--0.00° (repeats options)
<i>Eighth press</i>	<i>Fractional Mode:</i>
of Stor :	--Std.
+	--COntSt
+	--Std. (repeats options)

*Note: Press **On/C** at anytime to exit the Preference Settings.*

ENTERING DIMENSIONS

Linear Dimensions

When entering Feet-Inch values, enter dimensions from largest to smallest — Feet before Inches, Inches before Fractions. Enter Fractions by entering the numerator (top number), pressing **/** (Fraction Bar key) and then the denominator (bottom number).

Note: If a denominator is not entered, the fractional setting value is used.

*Examples of how linear dimensions are entered (press **On/C** after each entry):*

DIMENSION	KEYSTROKES
5 Yards	5 Yds
5 Feet 1-1/2 Inch	5 Feet 1 Inch 1 / 2
17.5 Meters	1 7 . 5 m

Square and Cubic Dimensions

*Examples of how Square and Cubic dimensions are entered (press **On/C** after each entry):*

DIMENSION	KEYSTROKES
5 Cubic Yards	5 Yds Yds Yds
130 Square Feet	1 3 0 Feet Feet
33 Square Meters	3 3 m m

CONVERSIONS

Linear Conversions

Convert 10 Feet 6 Inches to other dimensions, including Metric:

KEYSTROKE	DISPLAY
1 0 Feet 6 Inch	10 FEET 6 INCH
Conv Feet *	10.5 FEET
Conv Inch *	126. INCH
Conv Yds	3.5 YD
Conv m	3.200 M
Conv 9	3200.4 MM
Conv 7	320.04 CM

Repeated presses of **Feet or **Inch** will toggle between Feet-Inch-Fractions and Decimal Feet or Inches.*

Square and Cubic Conversions

Convert 14 square Feet to square Yards:

KEYSTROKE	DISPLAY
1 4 Feet Feet	14 SQ FEET
Conv Yds	1.555556 SQ YD

Convert 12 cubic Feet to cubic Yards:

KEYSTROKE	DISPLAY
1 2 Feet Feet Feet	12 CU FEET
Conv Yds	0.444444 CU YD

Weight Conversions

Convert 25 Tons to other Weights:

KEYSTROKE	DISPLAY
2 5 Conv 6 (tons)	25 Ton
Conv 4 (lbs)	50000. LB
Conv 1 (kg)	22679.62 kG
Conv 3 (met tons)	22.67962 MET Ton

Weight per Volume Conversions

Your calculator has the capability of converting between Weight and Volume. The Weight/Volume ratio is permanently stored by entering the value and pressing **Stor** **0**. The default value is 1.5 Tons per cubic Yard.

Find the Weight of 15 cubic Yards at 1.75 Tons per cubic Yard, then convert to other Weights:

KEYSTROKE	DISPLAY
1 • 7 5 Stor 0	
STORED	1.75 Ton Per CU YD
1 5 Yds Yds Yds	15 CU YD
Conv 6 (tons)	26.25 Ton
Conv 4 (lbs)	52500. LB
Conv 1 (kg)	23813.6 kG
Conv 3 (met tons)	23.8136 MET Ton

Converting D:M:S

Convert 23° 42' 39" to decimal degrees:

KEYSTROKE	DISPLAY
On/C On/C	0.
2 3 • 4 2 • 3 9	DMS 23.42.39
Conv •	23.71°

BASIC MATH OPERATIONS

Your calculator uses standard chaining logic, which simply means that you enter your first value, the operator (+, −, ×, ÷), the second value and then the Equals sign (=).

- A. 3 + 2 = 5.
B. 3 − 2 = 1.
C. 3 × 2 = 6.
D. 3 ÷ 2 = 1.5

This feature also makes the calculator simple to use for dimensional applications:

Adding and Subtracting Strings of Dimensions

Add the following measurements:

- 6 Feet 2-1/2 Inches
- 11 Feet 5-1/4 Inches
- 18.25 Inches

Then subtract 2-1/8 Inches.

KEYSTROKE	DISPLAY
-----------	---------

6 Feet 2 Inch 1 / 2 +

1 1 Feet 5 Inch 1 / 4 +

1 8 • 2 5 Inch = 19 FEET 2 INCH

− 2 Inch 1 / 8 = 18 FEET 11-7/8 INCH

Multiplying Dimensions

Multiply 5 Feet 3 Inches by 11 Feet 6-1/2 Inches:

KEYSTROKE	DISPLAY
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5 Feet 3 Inch × 1 1 Feet

6 Inch 1 / 2 = 60.59375 SQ FEET

Dividing Dimensions

Divide 30 Feet 4 Inches by 7 Inches:

KEYSTROKE DISPLAY

3 0 Feet 4 Inch ÷ 7 Inch = 52.

Divide 20 Feet 3 Inches by 9:

KEYSTROKE DISPLAY

2 0 Feet 3 Inch ÷ 9 = 2 FEET 3 INCH

PERCENTAGE CALCULATIONS

The **%** key can be used for finding a given percent of a number or for working add-on, discount or division percentage calculations. It can be used with any type of number, in any dimension (Feet, Inch, Millimeter, etc) and any type of convention (non-dimensioned, linear, square or cubic).

Calculating Percentages

Find 18% of 500 Feet:

KEYSTROKE DISPLAY

5 0 0 Feet × 1 8 % 90 FEET 0 INCH

Add 10% to 137 square Feet:

KEYSTROKE DISPLAY

1 3 7 Feet Feet + 1 0 % 150.7 SQ FEET

Take 20% from 552 Feet 6 Inches:

KEYSTROKE DISPLAY

5 5 2 Feet 6 Inch - 2 0 %
442 FEET 0 INCH

Divide 350 cubic Yards by 80%:

KEYSTROKE DISPLAY

3 5 0 Yds Yds Yds ÷ 8 0 %
437.5 CU YD

MEMORY OPERATION

Whenever the **M+** key is pressed, the displayed value will be added to the Memory. Other memory functions:

FUNCTION	KEYSTROKES
Add to Memory	M+
Subtract from Memory	Conv M+
Recall total in Memory	Rcl M+
Display/Clear Memory	Rcl Rcl
Clear Memory	Conv Rcl

Memory is semi-permanent, clearing only when you:

- 1) turn off the calculator;
- 2) press **Rcl** **Rcl**;
- 3) press **Conv** **Rcl**;
- 4) press **Conv** **X** (*Clear All*).

When memory is recalled (**Rcl** **M+**), consecutive presses of **M+** will display the calculated average and total count of the accumulated values.

Example:

KEYSTROKE	DISPLAY
3 5 5 M+	M+ 355. M
2 5 5 M+	M+ 255. M
7 4 5 Conv M+	M- 745. M
Rcl M+	TTL STORED - 135. M
M+	AVG - 45. M
M+	CNT 3. M
Rcl Rcl	M+ - 135.

PAPERLESS TAPE

The Paperless Tape allows you to display and review the last 20 entries of a calculation. **Rcl** **=** accesses the tape mode and **+** or **-** scrolls forward or backward through the entries.

*Note: The Paperless Tape is cleared each time **On/C** is pressed twice, the unit is shut off, or a Clear All is performed.*

Previewing Paperless Tape

KEYSTROKE	DISPLAY
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1. Enter a string of numbers:

4 Feet +	4 FEET 0 INCH
5 Feet +	9 FEET 0 INCH
6 Feet +	15 FEET 0 INCH
7 Feet =	22 FEET 0 INCH

2. Access the Tape function:

Rcl =	TTL= 22 FEET 0 INCH
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3. Scroll from first value to total:

+	01 4 FEET 0 INCH
+	02+ 5 FEET 0 INCH
+	03+ 6 FEET 0 INCH
+	04+ 7 FEET 0 INCH
+	TTL= 22 FEET 0 INCH

4. Scroll to last 2 values:

-	04+ 7 FEET 0 INCH
-	03+ 6 FEET 0 INCH

5. Exit Tape function and continue:

= *	TTL= 22 FEET 0 INCH
+	22 FEET 0 INCH
2 Feet =	24 FEET 0 INCH

*Displays total before exiting.

USING CONCRETECALC PRO

LENGTH, WIDTH, AND HEIGHT KEYS

Using the Multi-Function **Width** Key to find Area, Square-Up, and Perimeter

Find the Area, square-up and perimeter of a room measuring 15' x 20'.

KEYSTROKE	DISPLAY
On/C On/C	0.
1 5 Feet Length	LNTH 15 FEET 0 INCH
2 0 Feet Width	WDTH 20 FEET 0 INCH
Width	AREA 300. SQ FEET
Width	SQUP 25 FEET 0 INCH
Width	PER 70 FEET 0 INCH

Using the Multi-Function **Height** Key to Find Volume, Wall Area and Room Area

Find the Volume, wall Area and total surface/room Area if you have a Length of 15 feet, Width of 20 Feet and Height of 12 Feet.*

**Room Area includes 4 walls plus ceiling Area.*

KEYSTROKE	DISPLAY
On/C On/C	0.
1 5 Feet Length	LNTH 15 FEET 0 INCH
2 0 Feet Width	WDTH 20 FEET 0 INCH
1 2 Feet Height	HGHT 12 FEET 0 INCH
Height	VOL 3600. CU FEET
Height	WALL 840. SQ FEET
Height	ROOM 1140. SQ FEET

Volume of a Concrete Slab

Calculate the cubic Yards of concrete required to pour a slab that measures: 45 Feet 5 Inches long x 13 Feet 6 Inches wide x 5 Inches deep. If concrete is \$65 per cubic Yard, what will it cost?

KEYSTROKE

DISPLAY

On/C **On/C**

0.

4 **5** **Feet** **5** **Inch** **Length**

LNTH 45 FEET 5 INCH

1 **3** **Feet** **6** **Inch** **Width**

WDTH 13 FEET 6 INCH

5 **Inch** **Height** **Height**

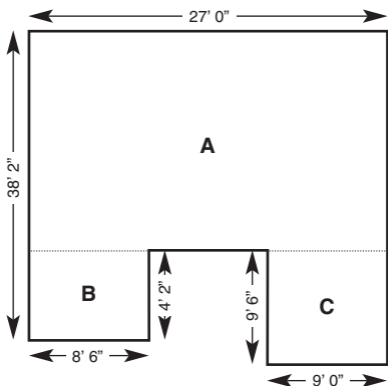
VOL 9.461806 CU YD

X **6** **5** **Conv** **0**

\$615.⁰²

(total cost)

Complex Concrete Volume



(Cont'd)

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You're going to pour an odd-shaped patio 4-1/2 Inches deep with the dimensions as shown. First, calculate the total Area (by dividing the drawing into three individual rectangles) and then determine the total cubic Yards of concrete required for this job. What is the total cost of the concrete if it is selling for \$55 per cubic Yard?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

0.

2. Find Area "A" and add to Memory:

3 **8** **Feet** **2** **Inch**

— **4** **Feet** **2** **Inch** **=** **Length**

LNTH 34 FEET 0 INCH

2 **7** **Feet** **Width**

WDTH 27 FEET 0 INCH

Width

AREA 918. SQ FEET

M+

M+ 918. SQ FEET **M**

3. Find Area "B" and add to Memory:

4 **Feet** **2** **Inch** **Length** LNTH 4 FEET 2 INCH **M**

8 **Feet** **6** **Inch** **Width** WDTH 8 FEET 6 INCH **M**

Width

AREA 35.41667 SQ FEET **M**

M+

M+ 35.41667 SQ FEET **M**

4. Find Area "C" and add to Memory:

9 **Feet** **Length** LNTH 9 FEET 0 INCH **M**

9 **Feet** **6** **Inch** **Width** WDTH 9 FEET 6 INCH **M**

Width

AREA 85.5 SQ FEET **M**

M+

M+ 85.5 SQ FEET **M**

5. Find Total Area/Volume and cost:

Rcl **Rcl** M+ 1038.917 SQ FEET

X **4** **Inch** **1** **/** **2** **=** 14.4294 CU YD

X **5** **5** **Conv** **0** \$793.⁶²

CIRCLE CALCULATIONS

Circumference and Area

Find the Circumference and Area of a circle having a diameter of 10 Inches.

KEYSTROKE DISPLAY

1. *Clear calculator and enter diameter:*

On/C **On/C** 0.
1 **0** **Inch** **Circ** DIA 10 INCH

2. *Find circle Area and Circumference:*

Circ AREA 78.53982 SQ INCH
Circ CIRC 31-7/16 INCH

3. *Convert to decimal Inch:*

Conv **Inch** 31.41593 INCH

Arc Lengths

Find the arc Length of an 85° portion of a circle with a 5 Foot diameter.

KEYSTROKE DISPLAY

1. *Clear calculator and enter diameter:*

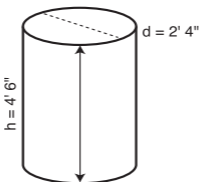
On/C **On/C** 0.
5 **Feet** **Circ** DIA 5 FEET 0 INCH

2. *Enter arc angle then find arc Length, chord, segment Area, pie slice Area, and segment rise:*

8 **5** **Arc** **Arc** ARC 3 FEET 8-1/2 INCH
Arc CORD 3 FEET 4-9/16 INCH
Arc SEG 1.522922 SQ FEET
Arc PIE 4.636031 SQ FEET
Arc RISE 0 FEET 7-7/8 INCH

Volume of a Cylinder

Calculate the Volume of a cylinder with a diameter of 2 Feet 4 Inches and a Height of 4 Feet 6 Inches:



Note: For a cylinder, use the Column function.

KEYSTROKE

DISPLAY

1. Find circle Area:

On/C **On/C**

0.

2 **Feet** **4** **Inch** **Circ** DIA 2 FEET 4 INCH

Circ AREA 4.276057 SQ FEET

2. Enter Height and find Volume:

4 **Feet** **6** **Inch** **Height**

HGHT 4 FEET 6 INCH

Conv **Circ**

COL 19.24226 CU FEET

Volume of a Cone

Calculate the Volume of a cone with a diameter of 3 Feet 6 Inches and a Height of 5 Feet:

KEYSTROKE	DISPLAY
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1. Find circle Area:

On/C On/C	0.
3 Feet 6 Inch Circ	DIA 3 FEET 6 INCH
Circ	AREA 9.621128 SQ FEET

2. Enter Height and find Volume:

5 Feet Height	HGHT 5 FEET 0 INCH
Conv Circ Circ Circ *	CONE 16.03521 CU FEET

*To access cone Volume, you must press the **Circ** key three times after **Conv**.

Volume of a Semicircular Pad

You want to calculate the Volume of a semi-circular pad with a diameter of 16 Feet and a thickness of 4 Inches. (Use the **Circ** key to find circle Area).

KEYSTROKE	DISPLAY
-----------	---------

1. Clear calculator:

On/C On/C	0.
-------------------------	----

2. Enter diameter:

1 6 Feet Circ	DIA 16 FEET 0 INCH
---	--------------------

3. Find circle Area:

Circ	AREA 201.0619 SQ FEET
-------------	-----------------------

4. Divide by 2 for semi-circle:

÷ 2 =	100.531 SQ FEET
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5. Multiply by thickness to find cubic Yards:

× 4 Inch =	1.241123 CU YD
--	----------------

Concrete Columns

Find the total cubic Yards and Tons of concrete (using 1.5 Tons per cubic Yard) required for three (3) columns, each with a diameter of 5 Feet 2-3/4 Inches and a Height of 10 Feet:

KEYSTROKE

DISPLAY

1. Recall stored Weight per Volume:

On/C **On/C** 0.
Rcl **0** **STORED** 1.5 Ton Per CU YD*

2. Enter diameter:

5 **Feet** **2** **Inch** **3** **/** **4** **Circ**
DIA 5 FEET 2-3/4 INCH

3. Find total Volume:

1 **0** **Feet** **Height** **Conv** **Circ**
COL 214.7607 CU FEET
Conv **Yds** 7.954101 CU YD
X **3** **=** 23.8623 CU YD

4. Convert to Tons:

Conv **6** 35.79345 Ton

*If it is not 1.5 Ton Per CU YD, enter **1** **0** **5** **Stor** **0**.

SQUARING-UP A CONCRETE SLAB

“Square-up” a concrete slab measuring 45 Feet 6 Inches by 24 Feet 4 Inches.

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C** 0.

2. Enter Length, Width and solve for diagonal Length (square-up):

4 **5** **Feet** **6** **Inch** **Length**
LNTH 45 FEET 6 INCH

2 **4** **Feet** **4** **Inch** **Width**
WDTH 24 FEET 4 INCH

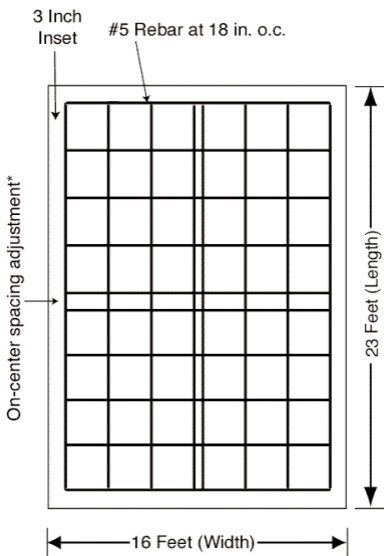
Sq-Up SQUP 51 FEET 7-3/16 INCH

CALCULATING REBAR

Rebar – Total Linear Feet

Find the total linear Feet of rebar for a 23 Feet x 16 Feet concrete slab, using default values for Rebar size (No. 5), on-center spacing (18 Inches), and inset (3 Inches).

Note: Overlap is not included in the calculation.



*Any adjustments for on-center spacing should be made in the center.

1. Clear calculator:
On/C On/C 0.
2. Enter rebar size*:
5 Rebar Size No 5 **STORED** 0.625 INCH
3. Find rebar Weight per Foot:
Rebar Size No 5 **1.04188** LB Per FEET
4. Enter rebar spacing:
1 8 Inch Conv Rebar Size
R-oc STORED 18 INCH
5. Enter rebar inset:
3 Inch Conv Rebar **R-IN STORED** 3 INCH
6. Enter slab Length:
2 3 Feet Length **LNTH** 23 FEET 0 INCH
7. Enter slab Width:
1 6 Feet Width **WDTH** 16 FEET 0 INCH
8. Find rebar total linear Feet:
Rebar **RBAR** 533 FEET 6 INCH
9. Find rebar total Weight:
Rebar No 5 **555.8428** LB
10. Display values used for calculating Rebar:
Rebar No 5 **STORED** 0.625 INCH
Rebar **R-oc STORED** 18 INCH
Rebar **R-IN STORED** 3 INCH
Rebar **LNTH** 23 FEET 0 INCH
Rebar **WDTH** 16 FEET 0 INCH

*Rebar size can be entered as a number for rebar sizes 3-11, 14, and 18 (e.g., **5 Rebar Size** for #5 rebar), or as a decimal or fractional value not exceeding 6 Inches in diameter (e.g., **5 7 8 Rebar Size** for 5/8 Inch rebar size).

Rebar – Total Weight

How many pounds of #5 Rebar are needed to layout 100 linear Feet of footings?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

2. Enter rebar size:

5 **Rebar Size** No 5 **STORED** **0.625 INCH**

3. Enter Length:

1 0 0 **Feet** **Rebar** **RBAR 100 FEET 0 INCH**

4. Calculate Weight:

Rebar **RBAR 104.188 LB**

CALCULATING LOADS

How many 8 cubic Yard truck loads would be needed to haul the dirt from an excavation measuring 108' x 48' and 1' deep?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C** **0.**

2. Enter load size:

8 **Yds** **Yds** **Yds** **Stor** **Loads**
L-SZ **STORED** **8. CU YD**

3. Enter site Length:

1 0 8 **Feet** **Length**
LNTH 108 FEET 0 INCH

4. Enter site Width:

4 8 **Feet** **Width** **WDTH 48 FEET 0 INCH**

5. Enter site Depth:

1 **Feet** **Height** **HGHT 1 FEET 0 INCH**

6. Find number of loads:

Loads **LOAD 24.**

BLOCKS AND BRICKS

Calculating Number of Blocks

You are building an "L" shaped retaining wall out of standard 8 Inch x 16 Inch blocks. One side of the retaining wall is 22 Feet long, and the other side is 15 Feet 8 Inches long. The wall is to be 4 Feet high. How many blocks are required to build this wall?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

0.

2. Enter block size:

8 **Inch** **X** **16** **Inch** **=**

Stor **Blocks** B-AR **STORED** 128. SQ INCH

3. Add both wall Lengths:

22 **Feet** **+** **15** **Feet** **8** **Inch** **=**

37 FEET 8 INCH

4. Multiply Length times Height:

X **4** **Feet** **=**

150.6667 SQ FEET

5. Find number of blocks and add 5% waste:

Blocks

BLKS 169.5

(170 Blocks)

+ **5** **%**

177.975

(178 Blocks)

Masonry — Estimating Bricks

How many standard bricks (2-1/4 x 8 Inch) are needed for a wall measuring 36 Feet 6 Inches long and 8 Feet high?

KEYSTROKE	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter brick Area: 2 Inch 1 / 4 X 8 Inch = Stor Blocks B-AR STORED	18. SQ INCH
3. Multiply wall Length times Height: 3 6 Feet 6 Inch X 8 Feet =	36 FEET 6 INCH 292. SQ FEET
4. Find number of bricks: Blocks	(Bricks) BLKS 2336.

POLYGON (Equal-Sided)

Find the full angle, bi-sect angle, side Length, perimeter and Area of a pentagon-shaped patio to be paved with bricks. The radius is 7 Feet 5 Inches and the number of sides is five:

KEYSTROKE	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter radius: 7 Feet 5 Inch Conv Arc	RAD 7 FEET 5 INCH
3. Enter polygon sides and calculate: 5 Conv Length Length Length Length Length	FULL 108.00° HALF 54.00° SIDE 8 FEET 8-5/8 INCH PER 43 FEET 7-1/8 INCH AREA 130.7868 SQ FEET

CONCRETE FOOTING

Find the number of cubic Yards of concrete required for a (16 Inch x 8 Inch) footing that measures 232 Feet 6 Inches in length.

KEYSTROKE	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter footing Area: 8 Inch × 1 6 Inch = Stor Ftg F-AR STORED	128. SQ INCH
3. Enter Length to find Volume: 2 3 2 Feet 6 Inch Ftg	FTG 7.654321 CU YD

Concrete Footings — Continuous Lengths

You are going to pour concrete for a 264 square Inch footing being used for the following continuous Lengths of footing: 15 Feet, 18 Feet, 24 Feet and 33 Feet. What is the total Volume of concrete you'll need?

KEYSTROKE	DISPLAY
1. Clear calculator: On/C On/C	0.
2. Enter footing Area: 2 6 4 Inch Inch Stor Ftg F-AR STORED	264. SQ INCH
3. Add Lengths: 1 5 + 1 8 + 2 4 + 3 3 = Feet	90. FEET
4. Find total Volume: Ftg	FTG 6.111111 CU YD

FINDING WEIGHT PER VOLUME

Find the total Volume and Weight of a 10 Foot high by 16 Foot long by 8 Inch thick concrete tilt-up wall. The unit Weight is 1.5 Tons per cubic Yard of concrete.

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

0.

2. Store unit Weight:

1 **•** **5** **Stor** **0** **STORED** 1.5 Ton Per CU YD

3. Enter Height, Length and thickness:

1 **6** **Feet** **Length** LNTH 16 FEET 0 INCH

8 **Inch** **Width** WPTH 8 INCH

1 **0** **Feet** **Height** HGHT 10 FEET 0 INCH

4. Solve for Volume:

Height VOL 3.950617 CU YD

5. Find Weight in Tons:

Conv **6** 5.925926 Ton

CONCRETE BAGS

How many 80 lb. bags of concrete would it take for a 4' x 8' slab 4" deep? Use default of 0.666667 cubic Feet per bag.

KEYSTROKE

DISPLAY

1. Multiply Length times Width times Depth:

On/C **On/C**

0.

4 **Feet** **X** **8** **Feet** **X** **4** **Inch**

=

0.395062 CU YD

2. Find number of bags:

Conv **5**

BAGS 16.

*Note: To change your bag size, enter the new volume per bag and press **Stor** **5** (e.g.; **•** **5** **Feet** **Feet** **Feet** **Stor** **5**). Bag size remains stored until a new bag size is stored in its place, or a Clear All (**Conv** **X**) or reset is performed.*

CALCULATING DROP

Drop of Sloped Patio

You're pouring a sloped concrete patio with a Length of 14 Feet. If the standard drop or fall is 1/8 Inch per Foot, what is the total drop or fall? What if the drop is 1/4 Inch per Foot or .375 Inch per Foot?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

0.

2. Enter total Length of wall:

1 **4** **Feet** **Length**

LNTH 14 FEET 0 INCH

3. Enter 1/8 Inch drop per Foot and find amount of drop:

1 **/** **8** **Drop** **Drop**

DROP 0 FEET 1-3/4 INCH

4. Enter 1/4 Inch drop per Foot and find amount of drop:

1 **/** **4** **Drop** **Drop**

DROP 0 FEET 3-1/2 INCH

5. Enter .375 Inch drop per Foot and find amount of drop:

. **3** **7** **5** **Inch** **Drop** **Drop**

DROP 0 FEET 5-1/4 INCH

6. Convert to decimal Inches:

Conv **Inch**

5.25 INCH

7. Convert to decimal Feet:

Conv **Feet**

0.4375 FEET

Drop of Retaining Wall

You're building a 61 Foot 8 Inch retaining wall along a driveway that slopes away at 1/4 Inch per Foot. There are 4 sections, each measuring 15 Feet 5 Inches in Length. What is the proper drop amount for each section? What is the total (accumulated) drop Depth at the end of all four sections?

KEYSTROKE

DISPLAY

1. Clear calculator:

On/C **On/C**

0.

2. Enter wall section Length:

1 **5** **Feet** **5** **Inch** **Length**

LNTH 15 FEET 5 INCH

3. Enter drop per Foot to find the drop per section and the total drop Depth at 1st wall section:

1 **/** **4** **Drop** **Drop**

DROP 0 FEET 3-7/8 INCH

4. Find total drop Depth of 2nd through 4th wall sections:

Drop

DROP 0 FEET 7-11/16 INCH

Drop

DROP 0 FEET 11-9/16 INCH

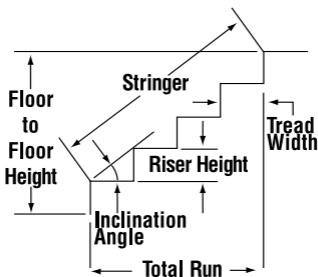
Drop

DROP 1 FEET 3-7/16 INCH

Note: Successive presses of **Drop** will continue to add the drop amount of 3-7/8 Inches to the prior wall section's drop, for an accumulated drop total.

STAIR CALCULATIONS

The *ConcreteCalc Pro* can calculate the values used in stair building, given entered values for floor-to-floor rise (**Height**) or run of treads (**Length**), based on desired riser Height and tread Width.



Stairs — Given Rise and Run

You're going to build a stairway that has a floor-to-floor Height of 10 Feet 1 Inch, a run of 12 Feet 5 Inches, and a desired riser Height of 7-1/2 Inches (default). Find the stair values:

KEYSTROKE

DISPLAY

1. Enter rise and run:

On/C **On/C** 0.

1 **0** **Feet** **1** **Inch** **Height**
HGHT 10 FEET 1 INCH

1 **2** **Feet** **5** **Inch** **Length**
LNTH 12 FEET 5 INCH

2. Recall stored 7-1/2" desired riser Height, then find the stair values:

Rcl **7** R-HT **STORED** 7-1/2 INCH

Stair R-HT  7-9/16 INCH*

Stair RSRS 16.

Stair R+/- 0 INCH

Stair T-WD  9-15/16 INCH*


Stair TRDS 15.

Stair T+/- 0-1/16 INCH

Stair OPEN 9 FEET 10-1/4 INCH

Stair STRG 15 FEET 7-5/16 INCH

Stair INCL 37.27°

*  in the display means that the calculated riser Height exceeds the desired (stored) riser Height, or the calculated tread Width is below the desired (stored) tread Width.

Stairs — Given Rise Only

You're building a stairway with a total rise of 9 Feet 11 Inches. Using the default riser Height of 7-1/2 Inches and tread Width of 10 Inches, find the stair values:

KEYSTROKE	DISPLAY
-----------	---------

1. Enter known rise:

On/C **On/C** 0.

9 **Feet** **1** **1** **Inch** **Height**

HGHT 9 FEET 11 INCH

2. Recall stored desired stair riser Height:

Rcl **7** R-HT **STORED** 7-1/2 INCH

3. Recall stored desired stair tread Width:

Rcl **9** T-WD **STORED** 10 INCH

4. Find stair values:

Stair R-HT 7-7/16 INCH

Stair RSRS 16.

Stair R+/- 0 INCH

Stair T-WD **STORED** 10 INCH

Stair TRDS 15.

Stair T+/- 0 INCH

Stair OPEN 10 FEET 1 INCH

Stair STRG 15 FEET 6-15/16 INCH

Stair INCL 36.64°

To calculate stairs given run (Length) only: If you have a value stored in Height, it will be used in the stair calculation. You will need to clear the value by entering zero into Height (e.g. **0** **Height**).

Stairs — Riser Limited Function

Calculate stairs using the Riser Limited function, if you must limit the riser Height to 7-1/2 Inches:

KEYSTROKE	DISPLAY
-----------	---------

1. Enter rise and run:

On/C	On/C	0.
-------------	-------------	----

1	0	Feet	1	Inch	Height	
						HGHT 10 FEET 1 INCH

1	2	Feet	5	Inch	Length	
						LNTH 12 FEET 5 INCH

2. Recall stored 7-1/2" desired riser Height and find stair values:

Rcl	7	R-HT	STORED	7-1/2 INCH
------------	----------	------	---------------	------------

Conv	Stair	R-HT	7-1/8 INCH
-------------	--------------	------	------------

Stair		RSRS	17.
--------------	--	------	-----

Stair		R+/-	0-1/8 INCH
--------------	--	------	------------

Stair		T-WD	 9-5/16 INCH*
--------------	--	------	---


Stair		TRDS	16.
--------------	--	------	-----

Stair		T+/-	0 INCH
--------------	--	------	--------

Stair		OPEN	9 FEET 9-5/8 INCH
--------------	--	------	-------------------

Stair		STRG	15 FEET 7-5/8 INCH
--------------	--	------	--------------------

Stair		INCL	37.42°
--------------	--	------	--------

*  in the display means that the calculated riser Height exceeds the desired (stored) riser Height, or the calculated tread Width is below the desired (stored) tread Width.

APPENDIX

ACCURACY/ERRORS

Accuracy/Display Capacity – Your calculator has a twelve digit display. This is made up of eight digits (normal display) and four fractional digits. You may enter or calculate values up to 19,999,999.99. Each calculation is carried out internally to twelve digits.

Errors – When an incorrect entry is made, or the answer is beyond the range of the calculator, it will display the word “**ERROR.**” To clear an error condition you must press the **On/C** button once. At this point you must determine what caused the error and re-key the problem.

Error Codes

DISPLAY	ERROR TYPE
OFLO	Overflow (too large)
MATH Error	Divide by 0
DIM Error	Dimension error
ENT Error	Invalid entry error
None	Attempts to calculate stairs without entering rise and run

Auto-Range – If an “overflow” is created because of a calculation with small units that are out of the standard digit range of the display, the answer will be automatically expressed in the next larger units (instead of showing “**ERROR**”) –

(Cont'd)

(Cont'd)

e.g., 20,000,000 mm is shown as 20,000 m. Also applies to Inches, Feet and Yards.

Note: If Exponential Notation is activated through the Preference Setting, the value will be shown in scientific notation (e.g., 20 million mm – 2.00000⁰⁷ mm).

BATTERY AND AUTO SHUT-OFF

Your calculator is powered by a single 3-Volt Lithium CR-2016 battery. This should last approximately 800 hours of actual use (1 year plus for most people). Should the display become very dim or erratic, replace the battery. **WARNING:** Please use caution when disposing of your old batteries as they contain hazardous chemicals.

Your calculator is designed to shut itself off after about 8-12 minutes of non-use.

Note: Values in memory or shown on the display will be cleared.

Replacing the Battery

Turn the calculator over and open user guide door located at the top. Pull battery holder out (top left corner) and turn over. Remove old battery and slide new battery under tabs. Turn holder over (negative side facing you) and insert into calculator.



DEFAULT SETTINGS

After a *Clear All* (**Conv** **X**), your calculator will return to the following settings:

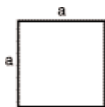
STORED VALUES	DEFAULT VALUE
Desired Riser Height	7-1/2 INCH
Desired Tread Width	10 INCH
Floor Height	10 INCH
Rebar Spacing	18 INCH
Rebar Inset	3 INCH
Rebar Size	#5 (5/8")
Load Size	8 CU YD
Bag Size	0.666667 CU FEET
Weight per Volume	1.5 Ton Per CU YD
Block Area	128 SQ INCH
Block Length	16 INCH
Footing Area	264 SQ INCH

If you replace your battery or perform a *Full Reset** (press **Off**, hold down **X**, and press **On/C**), your calculator will return to the following settings (in addition to those listed above):

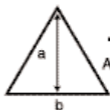
PREFERENCE SETTINGS	DEFAULT VALUE
Fractional Resolution	1/16"
Area Display	Standard
Volume Display	Standard
Stairway Headroom	6 FEET 8 INCH
Exponent	Off
Meter Linear Display	0.000
Decimal Degree Display	0.00°
Fractional Mode	Standard

Depressing the Reset button located above the **Length key will also perform a Full Reset.*

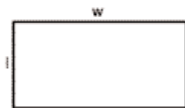
AREA FORMULAS



Square
Area = a^2



Triangle
Area = $1/2 ab$



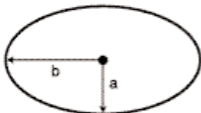
Rectangle
Area = lw



Octagon
Area = $(d/2)^2 \times 2.828$

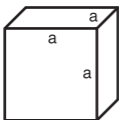


Circle
Circumference = $2\pi r$
Area = πr^2



Ellipse
Area = πab

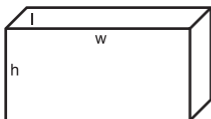
SURFACE AREA AND VOLUME FORMULAS



Cube

$$\text{Surface Area} = 6a^2$$

$$\text{Volume} = a^3$$

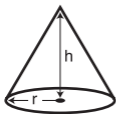


Rectangle

$$\text{Surface Area} =$$

$$2hw + 2hl + 2lw$$

$$\text{Volume} = l \times w \times h$$

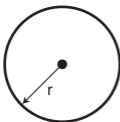


Cone

$$\text{Surface Area} = \pi r \sqrt{r^2 + h^2}$$

(+ πr^2 if you add the base)

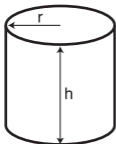
$$\text{Volume} = \frac{\pi r^2 h}{3}$$



Sphere

$$\text{Surface Area} = 4\pi r^2$$

$$\text{Volume} = \frac{4}{3}\pi r^3$$



Cylinder

$$\text{Surface Area} = 2\pi r h + 2\pi r^2$$

$$\text{Volume} = \pi r^2 h$$

REPAIR AND RETURN

WARRANTY, REPAIR AND RETURN INFORMATION

Return Guidelines

1. Please read the **Warranty** in this User's Guide to determine if your Calculated Industries product remains under warranty **before** calling or returning any device for evaluation or repairs.
2. If your product won't turn on, check the battery as outlined in the User's Guide.
3. If you need more assistance, please go to the website listed below.
4. If you believe you need to return your product, please call a Calculated Industries representative between the hours of 8:00am to 4:00pm Pacific Time for additional information and a Return Merchandise Authorization (RMA).

Call Toll Free: 1-800-854-8075

Outside USA: 1-775-885-4900

www.calculated.com/warranty

WARRANTY

Warranty Repair Service – U.S.A.

Calculated Industries (“CI”) warrants this product against defects in materials and workmanship for a period of one (1) year from the date of original consumer purchase in the U.S. If a defect exists during the warranty period, CI at its option will either repair (using new or remanufactured parts) or replace (with a new or remanufactured calculator) the product at no charge.

THE WARRANTY WILL NOT APPLY TO THE PRODUCT IF IT HAS BEEN DAMAGED BY MISUSE, ALTERATION, ACCIDENT, IMPROPER HANDLING OR OPERATION, OR IF UNAUTHORIZED REPAIRS ARE ATTEMPTED OR MADE. SOME EXAMPLES OF DAMAGES NOT COVERED BY WARRANTY INCLUDE, BUT ARE NOT LIMITED TO, BATTERY LEAKAGE, BENDING, A BLACK “INK SPOT” OR VISIBLE CRACKING OF THE LCD, WHICH ARE PRESUMED TO BE DAMAGES RESULTING FROM MISUSE OR ABUSE.

To obtain warranty service in the U.S., please go to the website.

A repaired or replacement product assumes the remaining warranty of the original product or 90 days, whichever is longer.

Non-Warranty Repair Service – U.S.A.

Non-warranty repair covers service beyond the warranty period, or service requested due to damage resulting from misuse or abuse.

Contact Calculated Industries at the number listed on the last page of this guide to obtain current product repair information and charges. Repairs are guaranteed for 90 days.

Repair Service – *Outside the U.S.A.*

To obtain warranty or non-warranty repair service for goods purchased outside the U.S., contact the dealer through which you initially purchased the product. If you cannot reasonably have the product repaired in your area, you may contact CI to obtain current product repair information and charges, including freight and duties.

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FCC Class B

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules.

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Calculated Industries, a leading manufacturer of special-function calculators and digital measuring instruments, is always looking for new product ideas in these areas.

If you have an idea, or a suggestion for improving this product or User's Guide, please submit your comments online at www.calculated.com under "Contact Us", "Product Idea Submittal Agreement". Thank you.



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