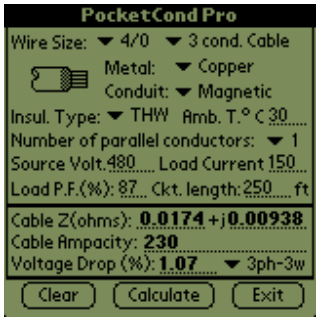
PocketCond Pro

By AZH Software



PocketCond Pro is an application designed to determine (quickly and easily), the ampacity and properties of electric conductors. The calculation and information provided by the applet is based on the National Electrical Code™ (NEC) and others reliable engineering sources.

By selecting the conductors characteristics, you can get the right ampacity, considering:

1-Conductors sizes (Awg, Kcmil)
2-Insulation type (TW, THW, RHH, etc.)
3-Metal of wires (copper or aluminum)
4-Cable arrangement (3 conductors cable, Two or Three single conductors).
5-Ambient Temperature.
6-Number of conductors connected in parallel (in case of).

All the information in table 310-16 and 310-17 and the correction factors due to ambient temperatures are included in PocketCond.
PocketCond returns with the current carrying capacities (ampacity) of the conductors only (Tables 310-16 and 310-17). It does not calculate the ampacity of the termination.
The ampacity of the termination is often lower than the conductor's ampacity, as stated in Article 110-14(c) of NEC.

The **Options** include a complete and fully accurate information of conductor properties, based on ASTM Specifications. For copper and aluminum, the application returns with the following information:

Area (Circular Mills, square inches)
Diameter (Inches, millimeter)
Number of wire (for cables)
Weight (lb/1000 ft, kg/1000 M)
D.C. Resistance (20°C, 25°C, 75°C)
Breaking Strength and Rated Strength (lb., kg)

The **impedance and voltage drop** is calculated with the exact method, using:

Load current
Circuit length (one way)
Metal of wires
Type of conduit
Source Voltage (A.C. 60 Hz)
Load power factor
Number of conductors in parallel
Circuit types (3 phase-3wires, 1 phase-2 wires)

The impedance is normalized for 75 ºC (average temperature) and is based on the Consulting Application Guide from Westinghouse™, and Standard Handbook of Electrical Engineers. For other temperature, the resistance of the conductors will vary. Users can correct the resistance for other temperature applying the following formula:

R2=R1[1+a(T2-75)]

Where:R1: resistance at 75 ºC
R2: resistance at new temperature (T2)
A = 0.00323 for copper
A = 0.00330 for aluminum

The voltage drop is calculated using the "Exact Method" with the following equation:

$$Evd = \sqrt{3}\left[Es + IRCos\varphi + IXSin\varphi - \sqrt{Es^2 - \left(IXCos\varphi - IRSin\varphi \right)^2} \right]$$

Where:

Evd = Voltage drop, line-to-line, volts

Es = Source voltage, line-to-neutral, volts.

I = Load current, amps

R = Circuit resistance, ohms

X = Circuit reactance, ohms.

Cosφ = Power factor of load, decimal.

Sinφ = reactive factor of load, decimal.

PocketCond calculates the voltage drop in percent and also uses the power factor in % to make it easier for general users.
The applet is based on the Power Distribution System Design from Westinghouse™, catalog 55-000, 10 Th. edition.

The **Options** include a feature for calculation of the voltage drop for any given circuit resistance and reactance.

HOW TO USE IT:

A) For **ampacity** calculation:

1-With the stylus, tap the first drop-down list and select the wire size (Awg # 14,12,10.....1000 Kcmil).

2-Tap the second drop and select the cable (3 conductor's cable, two or three single conductors, and single conductors in free air).

3-Select the metal of the conductors (copper or aluminum).

4-Select the insulation type (TW, THW, RHH.....Etc.).

5-Enter the ambient temperature ºC (default: 30 ºC).

6-If more than one conductor is connected in parallel per phase, select the number or them (default: one conductor).

7-Tap the calculate button.

In the lower box the result appears as Cable Ampacity.

B) **For Voltage Drop Calculation (Main Screen):**

1-Follow all the steps from 1 to 6 as for ampacity calculation.

2-Enter the source voltage.

3-Enter the load current, amps.

4-Enter the power factor, %.

5-Enter the circuit length (feet), from source to load (one way).

6-Select the circuit type (3 phase-3 wires, 1 phase-2 wires).

7-Tap the calculation button.

The voltage drop appears in the lower box.

Note #1:
Every time you change something, you need to recalculate again with the "Calculate" button. The applet does not calculate automatically.

Note #2:
PocketCond does not calculate the impedance of single conductors in free air, because the impedance depends on several factors including the distance between lines. That type of calculus is beyond the scope of this program.

Abbreviations:

3 cond. Cable	=	Three Conductors Cable(Table 310-16)
2 or 3 S. Cond	=	Two or Three Single Conductors (Table 310-16).
S. Cond. free air	=	Single Insulated Conductors in free air (Table 310-17).

INSTALLATION:

Using your favorite program, install the following files:

MathLib.prc	Math shared library.
PocketCond.prc	PocketCond Pro application

Files Included:

PocketCond.prc	PocketCond Pro application
MathLib.prc	Math shared library.
Instructions.doc	this file

Why should you register this program?

You will be able to download and use new versions of this applet for free, using the same registration number.

You will be given one month to evaluate the program.

When you "forget" to register the applet will expire.

After you register you will receive an e-mail with your personal registration number. This registration number is intended for only one user and it's linked to the username.

With your registration you help to encourage the developing of applications for the electric community.

For registration please go to:
http://www2.viaweb.com/pilotgearsw/arzher.html
http://arismendiz.tripod.com/Home1.html

LEGAL:

The application is provided AS IS, with no guarantee of fitness for any particular task. The user assumes all responsibility for its use.