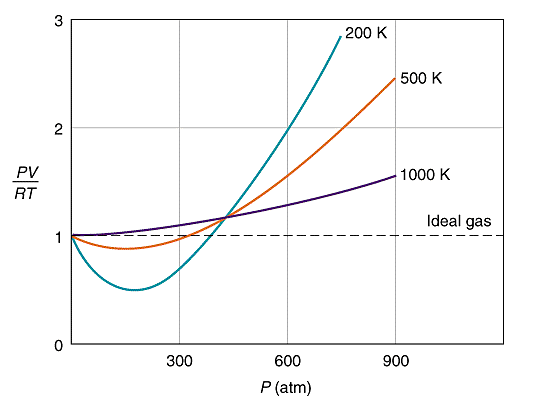
The proposed program calculates the **compressibility factor for AIR** with the calculator operating in the **ALGEBRAIC MODE**

The compressibility factor relates the behavior deviation between real and ideal gases. The ideal gas model tends to fail at low temperatures or high pressures, needing correction.



Example of deviant behavior in relation to ideal gases (nitrogen in this case)

Source: <http://www.chem.ufl.edu/~itl/4411/lectures/lec_e.html>

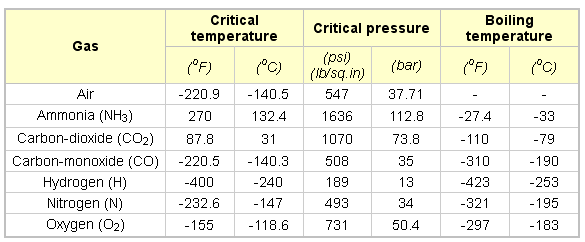
The compressibility factor expressed by the relation:

The used algorithm is proposed by **Tapan Kumar Sen**, published by **Breno Tresoldi Minzon** and **Fabio Malavazzi Santilio**. The original program that operates in Reverse Polish Notation (RPN) is available in <http://www.hpcalc.org/details.php?id=5806>.

The proposed approach is iterative, making interesting the use of programmable computers. The method consists of an initial guess of "Z" and iteratively achieve convergence between the formulas below:

is the reduced pressure given by , and is the reduced temperature given by . The constants are the critical pressure and critical temperature of the gas. The available program is set to compute the compressibility factor of **AIR**, with the constants:

For other gases:



Fonte: <http://www.engineeringtoolbox.com/gas-critical-temperature-pressure-d_161.html>