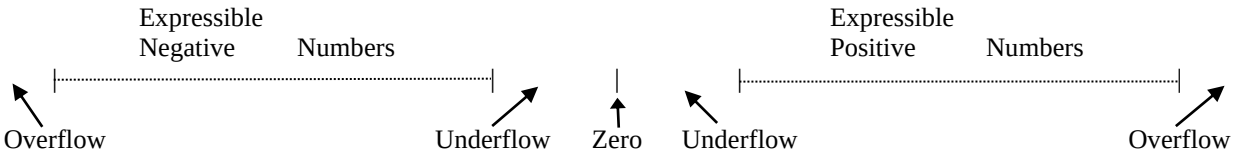
NUMBER RANGES IN FLOATING POINT

The range of numbers represented by a given format can be viewed on a line linking the values. The range available to the system will appear as follows :-



ERRORS IN A F.P. SYSTEM

There are several possible sources of error when working with floating point numbers:

Numeric Underflow	a number very close to zero, too small to be represented in the floating point format.
Numeric Overflow	a number too large to be represented in the floating point format.
Inexact result	Result not exactly expressible. There are two main reasons for this: a) The larger the numbers, the greater the gaps between the numbers that can be represented. b) A larger number of fractions are represented by infinitely recurring numbers. In both cases, the stored number will be an approximation. All that one can do is use enough bits to store the number such that the errors will be insignificant. A typical 32 bit processor will use a 72 bit register to carry out calculations in, before rounding off the result to 32 bits.
Division by zero	Not computable. Must be signaled as a numeric error. Software should not allow this to occur. If it does and the largest expressible number is returned to the processor (the nearest expressible number to infinity!) with no error indication, the cpu will treat it as the correct answer and calculation errors will result.