

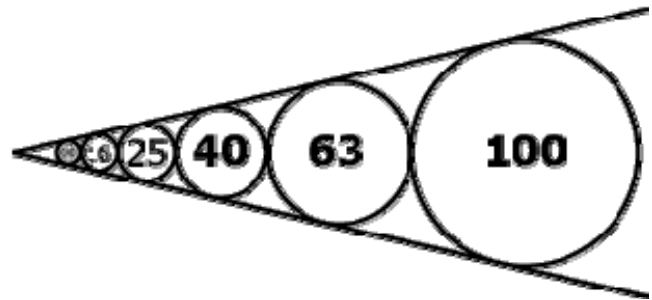


## PRESSURE SOLUTIONS

### C105: Dials, Ranges & Resolution (VM)

You will have noted from our pressure gauge data sheets that we restrict our ranges to certain standards, and that our dials are also standardised. There is method behind this madness.

It was a Colonel Renard who first introduced a formal system of preferred numbers in the 19<sup>th</sup> century, by dividing the range from 1 to 10 into a number of geometrically spaced steps. This works out as shown right.



Sizes for pressure gauges are based on the ISO R5 series, (Renard 5 step). There is a slight modification when we come to ranges, for reasons discussed below, where the 63 is replaced by 60.

There is another older simpler preferred series, 1, 2, 5, 10 which allows any integer number to be built up from a selection of these numbers. You will recognise this sequence from money. (Don't ever accept a R3 coin!). It is also used to determine deadweight tester weights.

This is the series used for dial resolution. If you look at any scale, you will see that divisions are in units of 1, 2 or 5, these being the prime factors of 10. We can count in 1s, 2s or 5s in the decimal system. When it comes to dividing a graduation by eye, we again will choose a division based on these intervals.

We can use a 63 range, but we would obviously want the main figured divisions to be 10, 20, 30, 40, 50, 60, which means there would be 3 divisions left over, and that would be possible but untidy. We could I suppose have figures 21, 42, 63 with divisions of 3 and 7 graduations per figure, but what would you think of such a dial? How would you lay it out?

When we designed our Blanes range of dials, we used these principles and came up with the following:-

- The 100 dial is divided into 100 divisions, making each division 1.
- The 160 dial is divided into 80 divisions, making each division 2.
- The 250 dial is divided into 125 divisions, making each division 2.
- The 400 dial is divided into 80 divisions, making each division 5.
- The 600 dial is divided into 120 divisions, making each division 5.

Compound ranges are chosen such that the total scale complies with one of the above, e.g. -100 + 300 (= 400), or -40 + 60 (= 100).

The final rule is that integers are preferred over fractions, but dial figures should not exceed 4 digits. Hence 6 000 kPa rather than 6 MPa, but 10 MPa rather than 10 000 kPa.

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