

Control Chart for Individual Measurements

A control chart for individual measurements must never be drawn by computing the control limits with the sigma that you get on a pocket calculator, despite the fact that these limits are usually named « three sigma limits ». The reason is that this calculation method does not take into account the data order on the control chart. The only valid method is the Shewhart one : the Moving Range method.

Here is an example that will easily make understand that the « pocket calculator sigma » leads to wrong conclusions when it is used in order to calculate the control limits.

Given a series : 162 ; 130 ; 180 ; 179 ; 310 ; 334 ; 355 ; 448 ; 595 ; 773 ; 809 ; 789 ;

The pocket calculator gives :

$$\text{Average} = 422$$

$$\text{Sigma} = 258$$

Hence the control limits :

$$\text{UCL} = 1196$$

$$\text{LCL} = 0$$

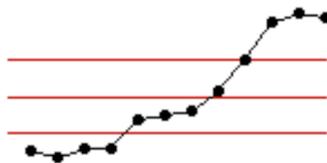
We can see that all the data are inside the control limits. Therefore we could conclude that the process is under control.

The software application MOVIRA, using the Shewhart method, gives us :

$$\text{Average} = 422,00$$

$$\text{UCL} = 599,17$$

$$\text{LCL} = 244,83$$



Conclusion. In this example, the control chart drawn according to the Shewhart method shows us that the process is not under control. On the contrary, the control limits calculated by using the « pocket calculator sigma » could make us think that it is under control.

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