

**Small samples weighing
with the highest accuracy**
even with the use of large tare containers



Movable weighing range

OF RADWAG LABORATORY BALANCES

MOVABLE RANGE: function used in Radwag balances of high resolution. By means of movable range it is possible to determine sample weight precisely no matter how high or low weight value of tare container is.

The least complicated example to be analysed is sampling of small amount of powder (80 mg) to a vessel (flask) of heavy weight (100 g). Standard analytical balance ($d=0,1$ mg) performs weighing process using accuracy of constant value which in practice equals about 0,2 mg. This result is an effect of balance indications repeatability. It can be easily concluded that the sample error must equal at least 0,2 mg likewise. When it comes to uncertainty budget for this weighing process, value of reading unit $d=0,1$ mg must also be taken into account. Needless to say, it even more increases value of uncertainty parameter.

In order to measure the same sample with a greater accuracy, it is necessary to use balance with a reading unit $d = 0,01$ mg. Radwag offers two lines of such balances. The first line features balances weighing with 0,01 mg accuracy exclusively. Quite problematic issue of these balances is their maximum capacity. For the discussed example it shall be at least 110 g. Another important decisive factor might be the price. Regardless of it, the balance still provides weighing range with maximum capacity of 110 g, which might turn out to be insufficient. Currently 220 g weighing range is considered to be the standard.

The second line features balances with an option of weighing with two different reading units. In the lowest weighing range the balance performs measurement with 0,01 mg accuracy. Above certain threshold level, the reading unit automatically changes from $d = 0,01$ mg to $d = 0,1$ g. Supposing that the said threshold value is 82 g, the weighing process for the described sample practically remains unchanged. The sample weight will still be measured for reading unit $d = 0,1$ mg.

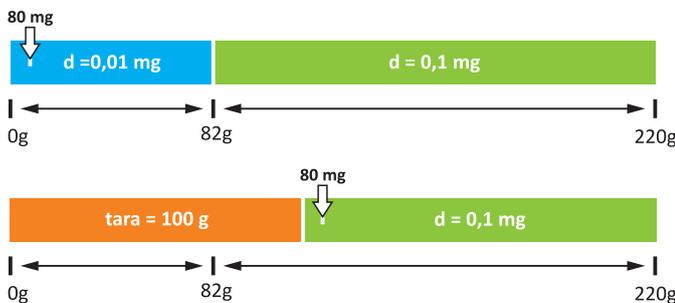


Fig. 1. Balance without movable range function.

The best solution is such one that regardless of used tare container guarantees reading accuracy characteristic for the early weighing range. Balances providing such an option are generally addressed by a colloquial phrase "movable range balances". This notion perfectly suits the balances since it reflects their nature. Owing to "movable weighing range" function, the balance can weigh even 80 mg heavy sample packed in a container of 200 g weight.

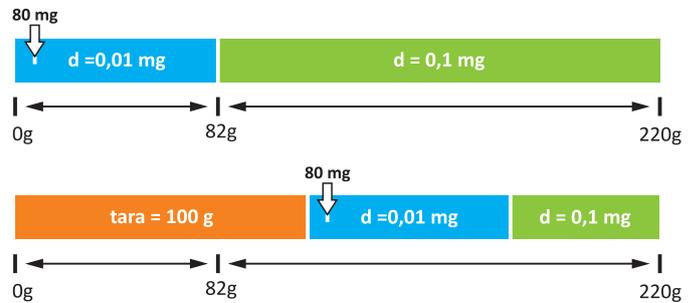


Fig. 2. Balance with movable range function turned on.

There is no need to mention how much "movable range" function influences balance versatility. With it, RADWAG provides accurate mass measurement and at the same time offering possibility of heavy samples weighing. Additionally, the said function positively influences calculated value of measurement uncertainty making it much lower, this is a result of reading unit value $d = 0,01$ mg.

Wondering if the above solution is the best possible option? For those who have to sample precisely portions of considerable weight, balance with reading unit $d = 0,01$ mg and 220 g maximum capacity is a good, nevertheless quite expensive solution. Another option are mass comparators that can be used instead of typical balances. Mass comparators offer at least one order of magnitude better accuracy of measurement. Before you decide to perform weighing procedure by means of mass comparator, pay attention to the fact that the comparator and the balance differ significantly in terms of measurement methodology.

Judging by experience, sampling of considerable weights with accuracy of reading unit $d = 0,01$ mg is not a common case therefore movable range balances shall be able to meet most of your needs.

Balances featuring function MOVABLE RANGE



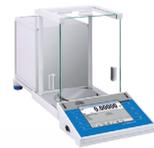
Microbalance
MYA 0,8/3.3Y



Microbalance
MYA 11/52.3Y



Analytical balance
XA 82/220.3Y.A



Analytical balance
XA 82/220.3Y

Max capacity [Max]	0,8 / 3 g	11 - 52 g	82 / 220 g	82 / 220 g
Readability [d]	1 / 10 μ g	1 - 10 μ g	0,01 / 0,1 mg	0,01 / 0,1 mg
Automatically opened door	•	•	•	-
Display			5,7" colour resistive touch panel	
Adjustment			automatic internal adjustment	